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A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART.

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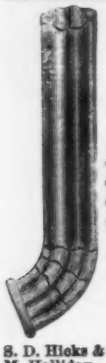

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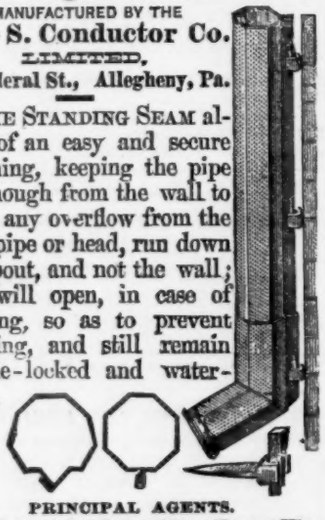

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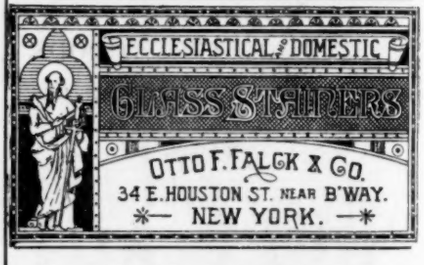

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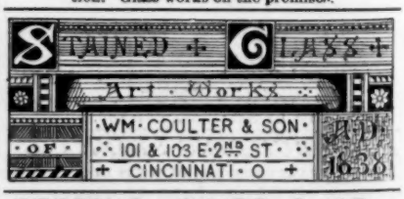

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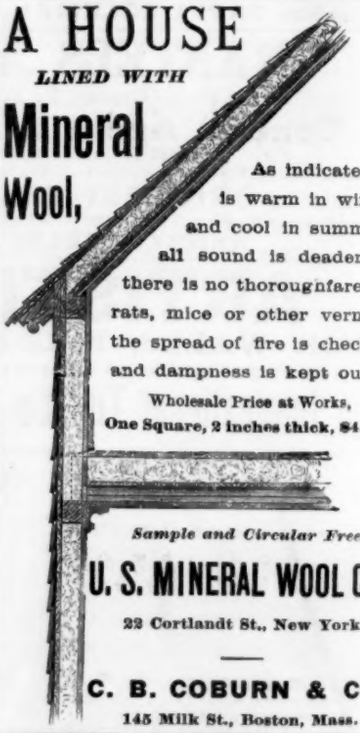

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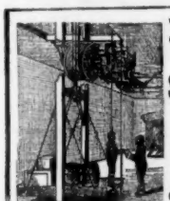
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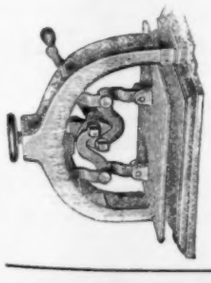
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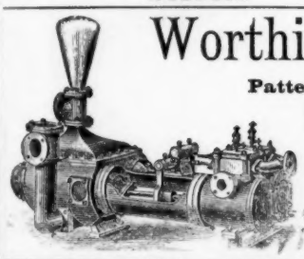
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Cash Capital	$1,000,000.00
Reserve for Re-insurance	625,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,585,141.29

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia. (Prices to Builders and Contractors.)
Common: *Cargo afloat.*				
Pale	$2 50 @ $3 50	Eastern	Building Brick	Hard
Jersey	4 50 @ 5 25	7 50 @ 8 00	8 00 @ 8 50	8 00 @ 8 50
		Bay State Hard		Salmon
Up River	5 00 @ 5 50	9 00		5 00 @ 6 00
Haverstraw Bay	5 50 @ 6 00	Domestic Com.	Indiana Pressd	Stretchers
" 1st	6 00 @ 6 50	8 00 @ 9 00	16 00 @ 28 00	11 00 @ 14 00
		Domestic Face	St. Louis Fronts	Pressed
Fronts:		19 00 @ 20 00	25 00 @ 30 00	20 00 @ 24 00
Croton, Brown	13 @ 14 00	Philadelphia		
" dark	14 @ 15 00	40 00 @ 45 00		
" red	14 @ 15 00	Phila. mould		
Chicago pressed		50 00 @ 80 00	22 00 @ 35 00	
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 @ 41 00		@ 55 00	
Glens Falls—white	30 @ 35 00	Glens Falls		
Philadelphia	@ 27 00	25 00 @ 26 00	42 00 @	
Trenton	@ 27 00		40 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge)	85 00 @ 100 00	@	@ 100 00	
Enamelled (edge and end)	90 00 @ 115 00	@	@ 120 00	Dom. @ 70 @ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	80 @ 1 00	@ 1 50	*Not Sold.*	1 25 @ 1 65
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	2 75 @ 3 00	2 30 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 75 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	@ 7 50	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 1 00	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 20	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	95 @ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	21 @ 23	@ 30	30 @ 35	24 @ 30
" (Goat)	30 @ 35	@ 30	35 @ 40	@
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	75 @ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	

(Continued on page vi.

10

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BUILDING MATERIALS.

	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia (Prices to Builders and Contractors.)
Foundation:				
Dimension	@	5 00 ₱ ton	20 @ 28	30 @ 5 00
Block	@	4 64 ₱ perch	8 50 ₱ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (₱ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone,				
Longmeadow		75 @ 85		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ₱ cub.ft.	
Amherst	1 00 @	90 @ 1 00	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	70 @ 90
Berlin	75 @ 1 00	80 @ 90	55 @ 65	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble:				
Lee, Mass	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	1 50 @ 2 50
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	—— @ ——
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	
Slate: Roofing (₱ *square*)				
" green	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	@ 7 00
" purple	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" red	@ 15 00	13 00 @ 14 00	—— @ 16 00	5 00 @ 5 75
" black, Lehigh	—— @ ——	Brownville, Me.	7 20 @ 7 60	5 00 @ 5 75
" " Chapmans	—— @ ——	6 50 @ 9 00	7 30 @ 8 00	6 00 @ 6 25
Tiles, Am. ₱ M	@	Monson, Me.	*Not sold.*	@ 15 00
		5 50 @ 8 00		
LUMBER. — ₱ M. (*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	44 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	40 00 @ 46 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	37 00 @ 44 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Cypress	@	32 00 @ 35 00	@	@
Clapboards:				
Pine	@	33 00 @ 55 00	14 00 @ 22 00	——@——
Spruce	@	23 00 @ 30 00	*Not sold.*	——@——
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 @ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 25 @ 2 35	2 25 @	——@——
Spruce	2 15 @ 2 25	2 15 @ 2 25	*Not sold.*	2 40 @ 2 60
Shingles:				
Pine, shaved	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed	4 00 @ 5 00	@ 4 50	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood	2 10 @	@ 3 00	5 50 @ 8 00	30" 8 10 @ 25
Cedar, split	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress. Split....7 x 24..	18 00 @ 20 00	5 00 @ 6 00	4 00 @ 4 50	16 00 @ 20 00
Miscellaneous:				
Piles ₱ ft.	4½ @ 6	Piles 6c. ₱ ft.	*Not so*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 2	12 00 @ 14 00
Cedar posts, ₱ ft. (sq. posts.)	@	25 @ 35	3 00 @ 3 00	7 @ 1
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ₱ M. *First Quality, Kiln-dried.)*				
Ash	@ 55 00	38 00 @ 48 00	35 00 @	
Cherry	80 00 @ 120 00	60 00 @ 90 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@ 180 00	100 00 @ 150 00	150 00 @ 180 00	100 00 @
" St. Domingo	@ 350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	45 00 @ 50 00	70 00 @ 80 00
Sycamore quartered		@ 65 00	45 00 @ 50 00	
Pine, clear	65 00 @ 70 00	3 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood ₱ lb	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 100 00	80 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 70 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine ₱ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil,* ₱ *lb.*)				
White lead, Am	5½ @ 6	5½ @ 6	5½ @ 5½	4 @ 6½
" Zinc, "	5 @ 8½	5 @ 8	7 @ 11	4 @ 8
Red, Am.,	6 @ 6½	6 @ 6½	5½ @ 6	
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	4 ₱ 6½
" Vermilion	55 @ 60	55 @ 60 dry	50 @ 60	Am. 12 @ 16
Red Indian, Eng	12 @ 20	12 @ 20	12 @ 20	12 @ 16
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	4 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	8 @ 20	8 @ 20	9 @ 14
Green, Paris,	25 @ 40	25 @ 40	16 @ 35	14 @ 29
Black, lamp,	15 @ 25	15 @ 25	8 @ 30	12 @ 18
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	20 @ 35
Oil, linseed, (raw) (₱ gal.)	53 @ 54	54 @ 59	48 @ 49	54 @ 58
" " boiled	56 @ 57	57 @ 62	51 @ 53	57 @ 60
Turpentine	30 @ 31	35 @ 42	32 @ 34	38 @ 41
Varnish, coach	@	1 50 @ 6 00	1 25 @ 2 00	1 40 @ 4 00
Shellac	@	2 50 @ 3 00	3 25 @ 4 00	1 75 @ 3 00
Putty	2 @ 3	2 @ 4	02 @ 03	2 @ 2½
Whiting (₱ cwt.)	50 @ 90	1 @ 1½	1 @ 2	½ @ 7-10
Paris white, (Eng.,)	2 @ 3	2 @ 3	2 @ 2½	1 30 @ 1 60
Litharge, Am	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7
Sienna, (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	@ 10	9 @ 14

(*Continued on page* vii.)

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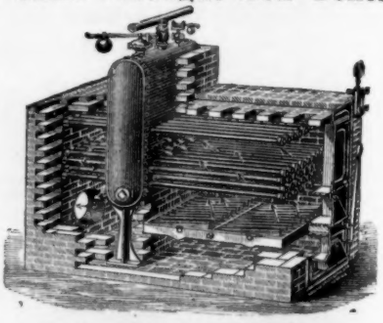

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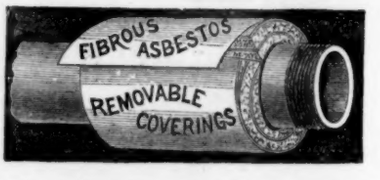

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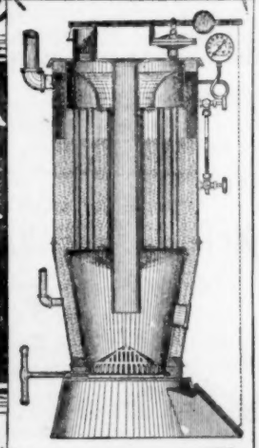

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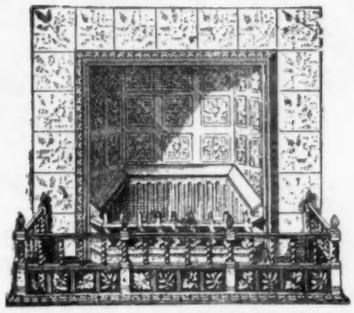

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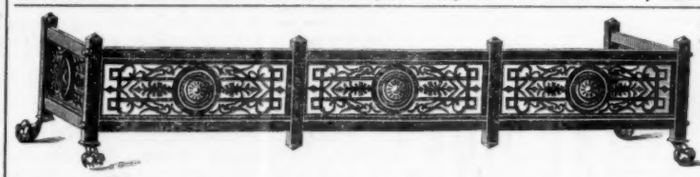

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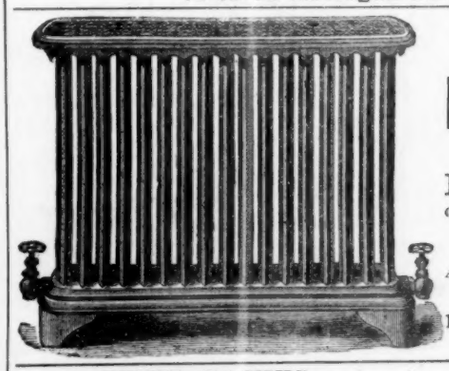

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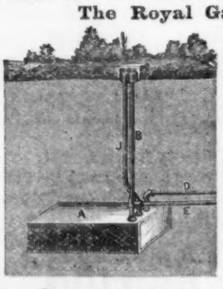

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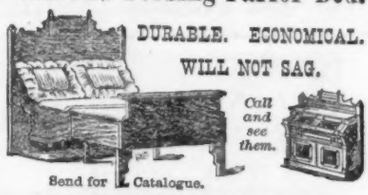

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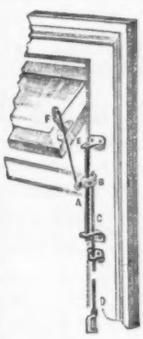

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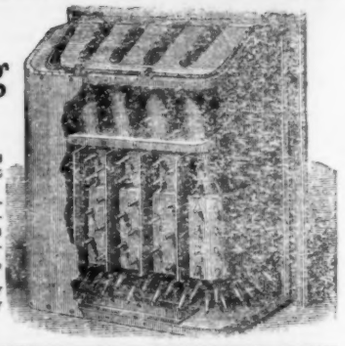

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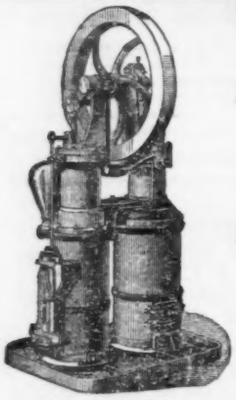

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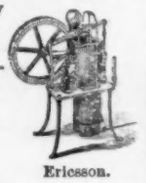

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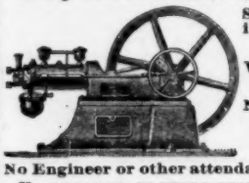

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THE *Scientific American* gives a description of a large ice-machine, in use in a brewery at Savigny-sur-Orge, in France, which is so simple in construction and in regard to the materials used that it may be worth while for architects to remember the principle on which it is operated. The apparatus consists, in substance, of three parts, the air-pump, which is of the least complicated description; the absorber, which is merely a cylindrical tank, twenty-five feet long and four feet in diameter; hung from the underside of a raised platform, and the ice-cylinders, which are really truncated cones, having their larger end turned downwards, and closed with a tightly-fitting door, and communicating at their upper ends with the top of the absorbing cylinder. At the commencement of the day's work the absorber is filled a little more than half full of concentrated sulphuric acid. The air-pump is then set in motion, and a partial vacuum produced in the absorber. When the barometer shows that the pressure has been sufficiently reduced, water is admitted from large reservoirs to the ice-cylinders. As these are in communication with the absorber, in which a vacuum exists, an active evaporation immediately takes place from the surface of the water, reducing its temperature rapidly; while the strong sulphuric acid, which has a great affinity for water, absorbs the vapor as fast as it is given off, so that the process of evaporation, instead of being checked by the filling of the vacuum with watery vapor in place of air, goes on until the temperature in the cylinders is reduced below the freezing point, and the water congeals into a solid mass. The valves at the bottom of the cylinders are then opened, and a jet of steam is turned for a moment into the space between the double walls of each. This loosens the blocks of ice, which immediately drop into tubs set on the floor to receive them. The whole process is nothing more than an ingenious application of the familiar experiment of freezing a watch-glass full of water by setting it under the receiver of an air-pump with a saucer of sulphuric acid, but there is something imposing about the scale at which it is carried on. The blocks of ice, as they drop from the cylinders, weigh nearly seven hundred pounds each, and six of them are produced at every operation. The whole process of charging, freezing, and removing the ice, occupies from three to four hours, so that a product of fifteen tons of ice every twenty-four hours would be quite within the capacity of the apparatus. After the acid which is used for absorbing the watery vapor has served its purpose a few times, it becomes too much weakened for efficiency, and is drawn off, and again concentrated by heating in a suitable tank with coils of steam-pipe, until water enough has been evaporated from it to restore its strength.

NOT long ago some rubber factories in New England were burned, and the insurance companies, finding that the rates charged for that class of property did not cover the risk, raised them. The manufacturers who were not burned out, finding that their expenses would be thus materially increased, and knowing something of the extraordinarily low cost at which cotton-factories are now insured under the mutual system, formed a project for a mutual insurance company among themselves, and consulted the officers of the Boston Manufacturers' Mutual Insurance Company on the subject. They were at once encouraged and cast down by the information that it would be perfectly practicable to form and carry on a rubber manufacturers' mutual insurance company, provided each manufacturer would begin by spending a sum on protective appliances for his own mill, proportionate to that which woolen manufacturers are obliged to lay out in the same way before they are allowed admission to their own mutual insurance companies. As the adoption of adequate precautions in rubber factories would cost the owners from ten to twenty thousand dollars for each, the enthusiasm of the manufacturers, according to the *Spectator*, disappeared, and the stock companies are likely to collect premiums of them for some time longer.

ON the face of it this result of the manufacturers' inquiries seems an illogical one. Nothing is more certain than that the premiums paid for insurance must in the long run equal the losses, or underwriting would cease; and as stock insurance companies are reputed to pay out as much money for agency and expenses as they do for fire losses, it would appear that the rubber manufacturers, by keeping their premiums to themselves, and saving the cost of maintaining agencies, might find it profitable to insure each other even without the investment of any more money in precautionary appliances than the stock companies would require them to spend. After the practice of insuring themselves had been fairly introduced among the manufacturers, they would soon begin to notice any carelessness on each other's part which might lead to an unnecessary increase of the risk which all shared in sustaining, and from this they would probably be led in time to the establishment of rules like those which the cotton and woolen manufacturers find it so profitable to impose upon themselves; and the whole rubber trade would receive great and permanent advantage. All this seems so obvious that one is inclined to wonder at the short-sightedness of manufacturers in continuing to insure their buildings and goods in stock companies when the mutual plan would, in theory, be so much more economical for them. The explanation of the matter is not, however, to be sought in the incapacity of the manufacturers, but in the insurance system, which consistently accepts such risks at rates far too low to cover the losses, lower, in fact, than the manufacturers themselves could afford to take them, and makes up for its annual deficit on account of these by enormous overcharges on property which is little liable to destruction by fire. As an illustration, we will suppose that in New York, between Twenty-third and Fifty-seventh Streets, and Third and Sixth Avenues, there are six thousand dwelling-houses, worth, on an average, with their contents, seventeen thousand dollars apiece, or one hundred million dollars in all. This, it will be understood, includes dwelling-houses only, tenement-houses and buildings with stores in them belonging to a totally different class. Supposing the rate of premium on this dwelling-house property to be six-tenths of one per cent for five years, which we take to be below, rather than above the average, its owners, to keep it covered, are obliged to pay every year to the insurance companies one hundred and twenty thousand dollars, a sum large enough to build from the foundations, and completely furnish, seven such houses annually, or a whole block every nine years. It is needless to say that the actual losses by fire in this district, among such buildings, amount in value only to a small fraction of the premiums paid, and the difference goes to swell the income of the insurance companies, and enable them to expend money in insuring bad risks at less than they are worth. The effect of this is inevitably to discourage the owners of flimsy, cheap, inflammable sheds from doing anything to make them better, and until some change in insurance methods is made, the "art of combustible architecture" is likely to continue to flourish. Fortunately, the indications point to the probability of such a change. For some years the rates on good risks have been diminishing, while those on dangerous buildings have been spasmodically raised; and although a wide space still intervenes between the underwriters' scale and the actual proportion of risk, every new approximation induces a corresponding change in building methods, to the advantage of the whole community.

MR. A. F. BANDELIER, the courageous and enterprising agent of the Archæological Institute of America, after recovering from the effects of his terrible journey into the mountains of Northern Mexico, two years ago, was sent southward, to the country about the City of Mexico, and still further south as far as Mitla, not far from the borders of Yucatan, to make what he calls "an archæological reconnoissance" in the skilful and judicious way characteristic of this admirable explorer. The story of his "reconnoissance," illustrated with photographs and sketches by the author, has just been published by the Archæological Institute, as the second volume of its American series of reports. Although a strictly scientific work, the author of the book carefully omitting from it everything foreign to his archæological studies, Mr. Bandelier's report has much of the interest of a book of travels, heightened, moreover, by the excellent illustrations, which have not merely the charm of being in great part photographs of the interesting objects described in the text, but are, when of this sort, well taken, and from favorable points of view, while the sketches, although not particularly picturesque, have a business-like, truthful air which makes them attractive. Although much space is occupied with discussions upon the ethnological connections of the present and past Indian tribes of Central Mexico, the author's efforts to obtain facts in aid of his impressions, by living familiarly among the modern Indians, have a singular attraction.

THE *Scientific American* quotes from the San Francisco *Chronicle* an account of some experiments made near San Francisco with dynamite, to learn its applicability to military purposes, especially for loading shells to be fired from cannon. It is generally supposed that a shell charged with dynamite cannot be fired from a gun, for the reason that the shock imparted by the explosion of the powder instantly explodes also the dynamite, bursting the gun; but these tests show that with care this may be avoided. The experiments were made with a wrought-iron rifled cannon of three inches bore, which had been condemned on account of its age and rusty condition, but was still perfectly sound. Shells of the ordinary shape, suited to the gun, were obtained and loaded with seven ounces of dynamite in each. The first was fired with a charge of a quarter of a pound of cannon-powder, at a high rock. The shell exploded on striking the rock, bursting into innumerable fragments. The second shell was fired from the gun with half a pound of powder, and, as before, reached the rock before exploding. The third shell was placed in the gun with the regular service charge of a pound of powder, and this time the concussion of the exploding gunpowder set off the dynamite before the shell left the gun, tearing the gun into fragments. Although the charge of dynamite was so small, the force of the explosion was sufficient to throw the rear portion of the cannon, weighing two hundred pounds, about twenty feet away, while the middle portion, which was much heavier, was thrown ninety feet into the air, landing on top of the neighboring cliff. As General Kelton, who conducted the experiments, says, the seven ounces of dynamite tore the gun as a hundred pounds of gunpowder could not have done. The principal use of such shells in warfare would probably be in the destruction of iron-clad ships, few of which could resist the explosion of a heavy charge of dynamite on deck, or even in contact with their sides, and the demonstration that they can be used for such purposes, without danger to the artillerists who employ them, is of much importance.

LA *Semaine des Constructeurs* contains a short notice of the manufacture of plate-glass mirrors at Saint-Gobain, which presents some curious details. The first Company of Mirrors was founded in 1665, with an authorization from King Louis XIV, and with the encouragement of the great minister Colbert. Twenty-six years later, Lucas de Néhou invented the process of casting glass plates, and established a factory in the old château of Saint-Gobain, and soon afterwards the Company of Saint-Gobain was reconstituted, and took the manufacture into its own hands. For a hundred and twenty-eight years the business was carried on by the successors of the original associates, but in 1830 a stock company was formed, under the same name, to which the manufacture was transferred. Like all great business corporations, the Company of Saint-Gobain has had to meet the competition of rivals, which has in many cases been overcome by the absorption or purchase of the weaker by the stronger establishment. The Company, which once found the Castle of Saint-Gobain large enough for its work, has thus now acquired or built factories at St. Quirin and Chauny, in the neighborhood of its own works, at Cirey in Eastern France, at Montluçon in the west, and at Mannheim and Stolberg in Germany. Within the time since the foundation of the plate-glass manufacture, a period of one hundred and eighty-two years, the processes have been improved, while the prices of the products have fallen to a remarkable degree. In 1802, for example, a hundred years after Néhou set up his casting-table, a finished mirror containing forty square feet of surface cost thirty-six hundred and forty-four francs, or nearly eight hundred dollars. Now the same can be bought, of much better quality, for forty-six dollars; and small mirrors, of ten square feet area, cost in 1802 forty-one dollars each, instead of eight dollars, which is the present price. The greatest variation in price is naturally found in the largest plates, since the size of the glass-sheet which could be handled with the old machinery was limited. Forty square feet was, in fact, about the maximum of regular sizes eighty years ago, while mirrors of one hundred square feet area can be had now without difficulty, and at a cost of only about a hundred and sixty dollars.

THERE seems to be no doubt that the approaching season is to be one of dullness in building operations, or, at least, that the building done will be of a modest class, as distinguished from the great and costly works which were in progress a few years ago. Some one has said that extensive strikes always indicate an approaching decline in business, and it is very probable that they do so, for two reasons, the first being that an incipient reduction in the volume of business throws a few men out of employment, and these, before packing their trunks to seek work elsewhere, naturally try first what effect loud talking will have in bettering their condition, and their companions, made apprehensive for the same reasons, are easily led into the violent measures which they are told will cure their troubles. The second and obvious reason why strikes go before a dull season is that they produce dullness. Every strike is immediately followed by the abandonment of a certain number of building projects, and the capital which would have found investment in that way is diverted elsewhere. The great strikes of 1883 undoubtedly destroyed the prospects of hundred of builders, architects, and workingmen in New York for many years, and the nine hour movement of the bricklayers this summer, with the foolish plumbers' quarrel, postponed or killed many new enterprises. The bricklayers' strike, as was to be expected, failed completely, but it is interesting to know that the claim of the men, that they could do as much work in nine hours as in ten, was to a certain extent verified. We were told by the superintendent of an important building, who was discreet enough to be one of the first to yield to the bricklayers' demand, that his men actually laid more bricks in nine hours than they had previously laid in ten. Whether they would have done so if there had been no competition is an unsettled question, but in his case there were, of course, scores of unemployed bricklayers always near at hand, and anxious for a job, and the knowledge that their places would be filled at ten minutes notice acted as a very lively stimulus to the powers of the men on the building.

A CORRESPONDENT of the *Sanitary Engineer* describes a curious experiment made at the aquarium of the National Fish Culture Association, in London, not long ago. It had been reported to the Association, on the authority of some American, that brandy would revive fish on the point of death from remaining too long out of water, and the secretary resolved to test the truth of the assertion. Two Prussian carp were therefore taken from the tank at the aquarium, and kept in the air for four hours. At the end of that time a little brandy and water was administered to one of them with a feather, and both were then put back into the tank. The fish which had been dosed with brandy quickly revived, but the other floated about on its side, as if quite dead; and, to avoid contaminating the water, as we suppose, it was taken out and thrown aside. The secretary, however, taking up the lifeless fish, opened its mouth and poured brandy and water down its throat, and placed it again in the tank, but with little expectation of seeing it revive. For five minutes it floated motionless, but some slight evidences of life appeared, and the fish soon began to move its fins feebly, and regained by degrees its usual strength. Neither of the fishes suffered, apparently, any permanent injury from their experience.

RECENT IMPROVEMENTS IN BUILDING.[1]—I.

Folding Screen exhibited at The Boston Mechanic's Fair by Messrs Keeler & Co "embossed leather rendered in metallic colors"

IT is not always easy for persons engaged in professional work to note clearly the advances which are made from year to year in the practice of their own profession. They see that changes come, but they take place insensibly, and become so soon a part of the regular technical routine, that their novelty is easily forgotten, and improvements dating back only a year or two are classed with those of twenty or thirty years' standing. In the art of building alone, among the practical sciences, are frequent opportunities given for comparing the new with the old method by the necessity, which falls to most architects and builders, of repairing, restoring or demolishing the work of their predecessors. In this way a sort of chronological table of building practice forms itself in the minds of architects, who find it important to understand the details of the construction, drainage and planning of ten, twenty, thirty and forty years ago, in order to be able to form a ready diagnosis, from the few symptoms presented to them, of the diseases of old buildings which they are called upon to mitigate or cure. Practice in this sort of professional work does not advance very far without disturbing some prejudices in the minds of most architects, the most common of which is the idea that our grandfathers, and even our elderly uncles, built more thoroughly and substantially than we do. Nothing could be more erroneous than this notion. It is desirable to speak with respect of our ancestors, but if their renowned intelligence and honesty were satisfied with the device of supporting the brick wall over a window on the wooden window-frame, without arch or lintel, as we see done in hundreds of houses on Beacon Hill, or with fireplaces built on the floor-beams, like those which have recently caused the destruction of so many noble houses in England, we may at least congratulate ourselves that something has been learned about safe building since their time.

The most important changes in regard to habits of construction that have been introduced within the last twenty years relate to protection from fire. Outside walls, which were once rarely more than twelve inches thick, and sometimes only eight inches, are now, in mercantile buildings, often twenty inches thick, and sometimes twenty-four inches in the first story and basement. There are few cases where twelve-inch bearing-walls, of good brick, laid, as usual, in mortar containing a portion of cement, would not safely support the weight of six floors loaded with heavy goods, and the additional thickness now required by the building laws of all our large cities serves no purpose except to give some extra steadiness, which is not needed, and to resist the communication of fire through the wall from one building to the next. Whether it is effectual for this purpose is doubted by architects, who observe that wooden floor-beams are often laid so far into very thick party-walls, to save the trouble of cutting them off, that no more brickwork intervenes between them, to prevent the transmission of fire, than if they had been set in the usual way in a twelve-inch wall; but this view of the matter does not seem to have occurred to the rest of the world, and the construction of an ordinary six-story store in any of our principal towns involves the use of at least one-half more rough brickwork than was thought necessary twenty years ago. By the side, however, of the rather crude legislative attempts at securing fire-resisting construction, a great deal of quiet but fruitful work has been going on in the same direction among private individuals, and the sum of knowledge upon the subject, available to all who wish to use it, has increased very greatly within a few years. Among those who have contributed to develop the art of building in this direction, the officers of a mutual fire insurance company in Boston unquestionably hold the highest place. Using, as every one must, the experience of others in addition to the results of their own investigations, they have analyzed these with so clear a judgment, and have fortified their conclusions with such thorough tests, as to give to the methods which they advocate an influence in the building world such as they themselves hardly suspect. It ought not to be necessary here to describe the details of construction which, thanks to their efforts, have already become common among the mill-owners of New England. Every one who has any acquaintance with mill-building knows now, in theory at least, the advantages of plank floors supported on wooden girders, of wire-lathing, of automatic sprinklers; but every one may not know that plank floors on heavy girders are already in use in scores of mercantile, as well as manufacturing buildings all over the country, and that the fashion is rapidly spreading; that, in the same way, the demand for wire-lath, since the days of its successful and economical use in the Mason & Hamlin factory and other mill-buildings, has so much increased that, as I am told, the principal makers in this part of the country run their works night and day, although a dozen rivals, at least, compete with them for their market; while automatic sprinklers, which only a few years ago were cautiously introduced into cotton-factories, have been placed over the stage in most of the new theatres since built, and in many old ones, giving probably better protection against fatal fires than all the other precautions put together.

Next to the officers of this company, those of the New York Board of Fire Underwriters have perhaps done most of late years toward improving the security of buildings. Although their efforts have been made with less intelligence and zeal than those of the others, they have shown a real interest in the subject, and a good deal of discrimination in dealing with it, and being armed with the tremendous power of controlling, in accordance with their ideas of suitable construction, the rates on perhaps a thousand million dollars of insurance, they are able, in many important points, to dictate absolutely the mode in which the better class of stores shall be built. No matter how penurious the owner of a new mercantile building in New York may be, or how ignorant or indifferent his architect or builder may show himself, he cannot now go very far astray from the path of solid and good construction. Unless his walls are intended to be thick, and the floor-timbers substantial, he cannot possibly get his plans passed by the Building Bureau, and it is not easy to vary in execution from the approved plans of such a building without detection and severe punishment; while, unless iron shutters are provided for all exposed openings, stairways and hatchways cut off in each story, and high parapet-walls built above the roof, both to prevent the communication of fire and to protect firemen at work there, the addition of five, ten, fifteen or twenty cents to the insurance rates will prevent him from getting tenants until these wholesome regulations are complied with.

This insurance control, which, it must be remembered, only dates back in New York, in any efficient form, about three or four years, has already had the effect of making general many precautions which were formerly introduced only as a matter of personal fancy. Thus, the automatic fire-alarm, once used as a curiosity, is now, through the allowance made for it in insurance premiums, becoming common throughout the "dry-goods district," and many other details are coming into use in the same way. As an illustration of the power which underwriters have over construction, if they only choose to exercise it, an application was made not long ago to the New York Board to fix a rate on a building in which a passenger-elevator was to be placed. The elevator ran in a brick shaft, and in order to prevent the shaft from acting as a conductor of fire from one story to another, it had been proposed, instead of the usual wire or glazed doors, to fit all the openings with self-closing solid doors, covered with sheet-brass, and furnished with small bull's-eyes, to enable persons waiting to see when the elevator reached them. The owners, like prudent men, hesitated to adopt this more expensive mode of construction, unless they could be sure that some advantage would result from it, sufficient to pay at least interest on the extra cost; but the underwriters, on having the character of the doors explained to them, offered at once to remit altogether the usual passenger-elevator charge, if they were used, and as this charge is now, in the dry-goods district, twenty cents per hundred, or one-fifth of one per cent a year on the whole insurable value of the building and its contents, the owners accepted forthwith an improvement which will save them its cost five or six times over every year in cash, while its value to the insurance companies, in lessening the risk of a destructive fire in that building, is probably at least equal to the allowance they make for it. It is to be regretted that underwriters in other places do not emulate the example of the New York Board. It is safe to say that in nine cases out of ten the architect of a store or warehouse building who suggests to the owners the adoption of any unusual precaution against fire is asked in reply, whether the insurance companies will make an allowance for it in their rates sufficient to pay interest on the cost. If they will do so, the improved construction is adopted; if not, the utmost eloquence of the architect generally fails to secure a trial of the new method; and it is for this reason that New York, where improvements of the kind are appreciated by those who have the largest interest in their adoption, is now far in advance of other towns in mercantile building.

Among other things, it is worth noticing that the importance of securing the plaster strongly to the ceilings, as a protection both against fire from below and water from above, has been understood there for many years, and before wire lathing came into any general use, the ceilings of dry-goods stores there were often strengthened by a device shown in this model, and still very popular. In applying this, the ceilings are plastered two coats, and as soon as the second coat is on, while the mortar is still soft, galvanized nails are driven into the laths and furring all over the ceiling, five inches apart each way, with the heads projecting half an inch or so from the plaster, and light brass wire is then stretched diagonally across the room, taking a turn around each nail. After wiring in one direction,

[1] A paper read before the Society of Arts, Boston, October, 1884, by Mr. T. M. Clark.

another set of wires is put on in the other direction, and after all are on the workmen go over the ceiling with hammers and drive in the nails until the heads are buried in the mortar. When the mortar is dry, the hard-finish coat is put on in the usual manner. The wires are thus embedded in the plastering, and hold it to the furrings with so much tenacity that in repeated instances, where fires have occurred in buildings so protected, the water from the engines has run through the floors, and collected above the plastering to a depth of several inches, and has remained there until it could be drained away, sometimes a week or more afterward, without any injury to the ceiling beyond a yellow stain. By the same means the mortar is prevented from being thrown from the laths by the heat of the fire below, and the wooden floors thus protected with an efficiency approaching that of wire lathing, and at a cost which was until recently much less than that of wire lathing. The latter is now, however, superseding it, and the next improvements of the kind will probably be modifications of the wire lath. A very promising one has already been introduced in the form of a corrugated wire netting, which can be applied either to beams or to the under side of plank floors, and around heavy girders, without the use of furring. Every one who employs wire lathing as a fire-resisting material must have regretted the necessity for covering the work to which it is applied with thin splinters of wood, usually six inches apart, for holding the wire netting far enough away from the surfaces to give a clinch to the mortar, and the corrugation, which fulfils the same purpose much more simply, and without adding combustible material, seems likely to prove very useful.

In the construction of buildings intended to be thoroughly fire-proof, New York stands in advance of the whole world. London, Paris, Berlin and Vienna contain some really fire-proof buildings, with floors vaulted in brick, heavy walls and small windows, and many others ostensibly fire-proof, with plaster floors held up by a light frame of iron, everywhere exposed, and constantly liable, if attacked by the heat of a pile of burning goods, to a disastrous collapse, like that which destroyed in a few minutes one of the largest stores in Paris a year or so ago; but New York alone can show many buildings thoroughly light and airy, in which it is impossible for a destructive fire to occur. The essence of these buildings is, as it must be with our present materials, a structure of protected iron-work in which the whole framework is cased with terra-cotta. The details of this sort of fire-proof work have undergone a good deal of modification within a few years, although the principles have not been changed. Not long ago a concrete of cinders and plaster was in high repute for filling between floor-beams, for partitions, for furring outside walls, and even for protecting iron, and various other concretes were much employed. These have proved, however, to be liable to crumbling from fire and water, and burnt clay is fast taking their place for all purposes. For furring, or lining outside walls, to keep the dampness of the brickwork from the rooms, the porous terra-cotta, or terra-cotta lumber, made by mixing saw-dust with fire-clay and baking it at a heat high enough to burn out the saw-dust, leaving a hard, spongy mass, is much preferred to the old-fashioned concretes, and the same form of burnt clay is used in thin blocks for forming partitions, which are so light as not to burden the floors, and at the same time strong and absolutely fire-proof, alternate heating to redness and saturating with water, many times repeated, having almost no effect upon it. For floors, burnt clay is now universally used in the shape of blocks, made hollow, to save weight, and tapered so as to form a flat arch, which has all the strength required and has the great advantage of presenting a level surface beneath, which is corrugated, to receive directly the plaster of the ceiling. The old-fashioned brick arches, turned upon the lower flanges of iron beams, have now entirely disappeared from ordinary work, except for carrying sidewalks over coal vaults. To say nothing of the unpleasant appearance presented by a ceiling broken up into long, parallel ridges, this construction, as usually seen, leaves the lower flanges of the iron beams exposed to heat from burning material in the room, thus violating the first principle of fire-proof construction as now practised, and the attempts made in former times to support a flat ceiling below the arches, by means of iron lath, have always been very costly and unsatisfactory.

In the matter of protecting the lower flange of the beams, even the construction of flat arches of hollow blocks was not at first very successful. As will be seen from the upper diagram, in plastering on the under side of the blocks a space equal to the width of the lower flange of the beam, often four or five inches, had to be spanned by the mortar, with nothing to hold it against the iron. In this position it was likely to break away, especially in case of fire, leaving the iron exposed, and the later blocks are made to hang a little below the beam, forming by their shape a dovetailed channel, in which a slip of terra-cotta is laid, when the pieces are put together, and is thus held securely. This gives perfect protection, but is a little troublesome, and the very latest blocks are made with projections wide enough to meet beneath the flange of the beam without the insertion of a slip. These blocks are as readily put in place as the primitive sort, and cover the beams securely from fire as soon as they are set. Common as these blocks now are in New York, being the universal material for flooring in all new banks and office-buildings, together with all the first-class apartment-houses, and many private dwellings, they are as yet hardly known elsewhere, unless in Chicago, where fire-proof building is practised with great success. Even in New York their use dates from very recent times, and it is said that in the construction of a building on Broadway, finished about four years ago, in which the architect required the floors to be laid with them, the masons employed by one of the best contractors in the city set them alternately upside down, so that they fell out when the staging was taken away from beneath them.

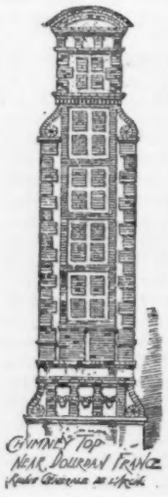
In England, the idea of the best architects is still to obtain the effects they wish in fire-proof construction by the use of concrete. They have an excellent material in their Portland cement, and, by adding sulphur to it, the concrete made with it is rendered partially fire-resisting, by the lessening of its tendency to crack and crumble under the action of fire and water; but no concrete construction yet invented approaches, in the facility with which the materials are handled, the quickness with which the work is completed and the staging shifted to another place, or in the perfect security which it gives, that with the terra-cotta hollow blocks. By the help of these, and of the porous terra-cotta partition and furring-blocks, a house with wide openings, floors ten inches thick from the level ceiling to the top of finished flooring, and partitions occupying different positions in the various stories, can be made just as secure against fire as a French or German storehouse, with its ponderous division-walls extending from cellar to roof, and its vaulted ceilings two or three feet high from the spring to the crown.

In describing a floor of a New York fire-proof building, we describe also the roof, which is made in exactly the same way as a floor, with iron beams, filled in and protected by hollow terra-cotta blocks, which are then levelled up with concrete, two, three or four thicknesses of asphalted felt laid on the top, and the whole then covered nearly or quite an inch thick with rock asphalt, precisely like that used for paving the streets of Paris, and put on in the same way. Once put down, on a sufficiently rigid framework of beams, such a roof is as permanent as the building itself. The heat of the sun does not affect it; water runs off it as from a granite slab, and the movement upon it, even of horses and carriages, would deteriorate it very slowly, if at all. With these roofs the flashings, even though of copper, are the weakest part, and in the latest of the great fire-proof office-buildings the flashings themselves are replaced by great slabs of rubbed slate, set vertically around the parapet walls, the lower edge of which is embedded in the concrete, while the wall itself is built out over the upper edge, holding it like a panel. It is difficult to see where the deterioration of a structure like this could begin. Centuries must elapse before either the asphalt roof-covering or the slate flashings would decay far enough to admit water to the interior, and extravagantly costly as the construction appears, it will probably be economical in the end.

It is usual in all these fire-proof buildings to lay a wooden floor, for comfort in walking, and this is now universally put on wooden sleepers, which lie on top of the terra-cotta blocks, and are held in place by having their ends so shaped that they can be wedged under the upper flanges of the iron beams. After these are in place, the space between them is entirely filled with cinders, and the wooden flooring is then nailed down. By filling the intervals between the sleepers with cinders, the circulation of air under the floor is prevented, and although it would perhaps be possible to burn a hole in the wooden floor by building a fire upon it, the fire could not spread, and experience shows that the currents of air around a fire draw so strongly upward that there would be no danger of heating the iron beams in this way sufficiently to do any harm; while the cinder-filled space, three or four inches in depth, affords an opportunity for carrying steam and water pipes under the floors from one part of a room to another, as is generally necessary in apartment-houses and office-buildings.

PHOTO-MECHANICAL PRINTING PROCESSES.[1]—II.

TYPE BLOCKS FROM LINE DRAWINGS, OR HALF-TONE SUBJECTS.



ANY impression in a fatty ink, of the nature of printers' ink, which may be transferred to stone or zinc for printing after the lithographic method, may be considered as the germ of a typographic printing block, as, if such an impression is transferred to a zinc plate, the uncovered parts may be etched away so as to leave the covered parts standing in high relief. The details of the method of this etching a zinc plate were given in one of the lectures of my previous series, and, therefore, it is needless to repeat them here. Let us take the reverse case. One has a typographic block, and it is more convenient to print impressions by the lithographic machine than from the block; it is only necessary to make a print from the block, and transfer it to the stone. Thus it will be seen that lithographic printing and typographic printing are very closely connected, so closely that when a subject is prepared for one it may be printed by either, as convenience may indicate. The *Official Gazette* of the American Patent Office is set up in type, but the printing of all, excepting the index sheets and the covers is done on a litho-machine.

These remarks bring us to the point where photo-lithography and photo-typography may be considered together,

[1] Cantor Lecture delivered before the Society of Arts by Thomas Bolas, F.C.S., and published in the *Journal of the Society of Arts*. Continued from No. 463, p. 227.

and that the making of a fatty transfer is equivalent to the production of a printing surface suitable for printing by either method. Still it seems to me that there is a large future before the litho-machine for commercial work, and that English printers are only beginning to see the real importance of Senefelder's discovery, for the production of commercial one-color work.

Now, as to the making a photo-litho transfer from plain black and white work, some progress has been made of late by the introduction of the velvet roller as a means of inking the exposed gelatine paper; the application of the velvet roller to this purpose being due to Mr. F. Butter, of Woolwich Arsenal. The ordinary litho-roller sticks to the paper, and drags off the coating; so much is this the case, that until the introduction of the velvet roller, but few persons attempted to ink up the image on the exposed gelatine paper with the roller; the usual practice being to follow the plan demonstrated in my last lecture — that is to say, to lay a ground of ink all over the paper, and after softening the gelatinous film by soaking in water, to remove the excess of ink by dabbing, or some such process.

Mr. Newland will now assist in the demonstration of the mode at present adopted for making a transfer by the velvet roller method.

The sensitive paper was prepared by floating thin bank-post paper on the following solution — the solution being of course, warm: —

Gelatine	3 ounces.
Water	50 "
Bichromate of potash	2 "

An exposure of five or six minutes in the shade is sufficient, after which the paper is soaked for some minutes in cold water, and the excess of water is blotted off. All is now ready for the inking of the image, and Mr. Newland has clamped down one side of the paper to the front edge of a kind of table, formed out of a slab of thick plate-glass, after which he will apply the velvet roller; always rolling it away from himself, so as to keep the paper level and stretched. The exposed parts now take the ink, and a transfer of surprising fineness is obtained. The velvet roller is charged with an ink made by mixing commercial transfer ink with about one-eighth of its weight of olive oil, a little turpentine being added to thin the mixture, if required;[1] but it is well to avoid the free use of turpentine.

Mr. Frewing has been good enough to bring here some specimens of his line work, not only in the transfer but also put down upon zinc; moreover, he has brought some wood blocks upon which the fatty transfer has been impressed, as a guide to the engraver.

Wood engraving has long held its own, but it is now very hardly pressed by the various processes, some of which are photographic and others not. Some years ago, the "graphotype" process made a little stir, but it did not compete with wood engraving to any extent worth mentioning, while, apart from the photographic methods, there are many others. Among the latest may be mentioned the glass etching process introduced by Mr. S. H. Crocker, of Sydney, and before you there are specimens of the *Australian Gazette* illustrated by this means. The resisting lines being obtained on the surface of the glass, hydrofluoric acid is used as an etching fluid, and, curiously enough, there seems to be scarcely any tendency to undercut under these circumstances.

So far we have only considered the use and production of transfers from such negatives as consist of only one gradation, clear white and intense black; and before passing on to the consideration of the means of obtaining transfers and blocks from ordinary negatives, in which every tint is reproduced more or less perfectly after the gradations met with in nature, let me point out to you some circumstances which will make it clear to you that we cannot, by simple photographic agency, produce representations from nature having quite the boldness of outline ordinarily met with in the most common kind of wood engravings; but there is now a movement among wood engravers to produce something better than was accepted twenty or thirty years ago — in fact, something more resembling a photograph.

Here is an engraving taken from the *Illustrated London News* of the year 1851 — the year of the Great Exhibition — and here, on the other hand, is a quite corresponding subject from the number published last Saturday. In the older engraving the figures are outlined by bold black lines, and the attempts at reproducing the exact shades or gradations of lighting, which we may suppose were visible in the case of the originals, are crude in the extreme. To sum up, the outline is the essence of the engraving, and but little effort is made to reproduce the shades of the original. Now, look at the engraving taken from the last number of the *Illustrated London News*. We certainly have outlines of a similar character, but very much less clearly marked, and everywhere an attempt has been made to represent the light and shades of the original by a corresponding closely packed collection of lines or dots. Now, look at a photograph of a strictly analogous subject. You see that the artificial outlines which the wood engraver uses to plot out his subject are altogether absent, and we only find that of shading which is altogether omitted in the less perfect example of wood engraving. To put the matter shortly, the second-rate wood engraver uses an outline as an index or pointer to his subject, and he often contents himself with this index or pointer alone, making no effort whatever to represent the true shades of the subject; and the public often prefer this index to the representation of the actual object, because it is easier to follow and to understand. Hence one of the main reasons why a typographic block made from an ordinary negative does not give satisfaction to those who have become accustomed to the mode of treatment adopted by wood engravers. In the photographic block there is no artificial outline, but only the shading. In addition to this, when any part of a figure has the same tone value as an adjacent part of the background, the photographic block makes no distinction between them — they merge into one another; while, in such a case, the wood engraver can make a distinction between the two parts, by making the shading lines incline in a different direction. The effect of photography in bringing about a more perfect system of wood engraving is to be observed in studying the wonderful specimens issued with the Transatlantic monthlies, *Harper* and *Scribner*. Here we often find the artificial outline or index lines either reduced to a minimum or altogether absent, and a fine shading introduced, which, when viewed from a little distance, almost strikes the eye like the gradated tints of a photograph. Side by side with the wood engravings in *Harper*, one often sees phototypic blocks made by the method of Ives; and in noting the great similarity of the effect to the eye, one hardly knows whether to congratulate the phototypist for his near approach to the most perfect examples of wood engraving, or to give praise to the wood engraver for his skill in so closely realizing the gradated lights and shades of the photograph.

In making a type block from a photograph, the first step is to translate the evenly gradated tints of the latter into a line system, or a stipple corresponding intensities. When a photograph is transferred to a wood block, this is done by the personal skill of the individual who engraves the block; but this is by no means to be regarded as photo-engraving proper, so my remarks will be confined to processes in which the translation is effected automatically.

There are so many methods of so translating the tints into points, line, or dots, that even to mention all would be impracticable. In now talking to you, there is no alternative but for me to assume considerable knowledge of the subject on your part, this course of lectures being of the nature of a supplement or appendix to my previous course.

In my last lectures the method of Asser was illustrated, a photo-lithographic transfer being made on a sheet of starched or pasted paper, made sensitive by means of potassium bichromate; and by putting down such a transfer on zinc, and etching into relief, excellent results may be obtained. It may also be mentioned that, as long ago as 1866, Messrs. E. and J. Bullock, of Leamington, obtained a patent for a mode of photo-lithography in half-tone, and a print, issued during the year in question with the *Photographic News*, shows that their work was equal to anything that has been done since. The print is before you, and you can judge for yourselves. Why, then, you may ask, did not the process become a great thing commercially, and make its mark? The answer is simply this — the invention came before its time, neither good litho-machining nor zinc-etching being practised at the time. The expired patent of Bullock Brothers, No. 2,954, 1866, will be read with interest, and its value is well illustrated by the fact that the essential points of it have been claimed by very many subsequent patentees. Bullock claims the production of reticulated transparencies, by copying a negative over which a grained surface is laid; this transparency affords the means of making a grained negative; but the method by which their best work was made is a second process included in the same patent. Ordinary or photographic paper is coated with a glutinous substance, and printed with a reticulated pattern. Let me now quote from the specification: — "In this case the specks of ink themselves form a medium, and by their aid excessive contrasts are avoided, and half-tones secured. Such picture, when so obtained, is passed to a lithographic stone or zinc plate, and a printed proof produced therefrom; by the aid of chromo-lithography, colored proofs may be produced." The coating of the paper with a glutinous substance may "be conducted in connection with bichromate of potash, or bichromate of ammonia." The said transfer paper may be used, "whether the impression be a lithograph, a zincograph, an impression from an electrotype, or from an engraved or etched plate."

Mr. Dallas' work you have seen before, and there are some specimens before you. He tells me that he supplied tint blocks for journalistic work (*The Garden*) as long ago as 1872.

By transferring a coarsely-grained collotype to stone or zinc, a very good grain image is obtained, and the coarse reticulation of the

[1] The following sketches and description, extracted from the *Photographic News*, will enable those who did not attend the lecture to sufficiently understand the construction of the velvet roller: — "Here is a sketch showing it complete and in section. The measurements specified are those to be recommended, and in the section we show the materials of which the roller is made. After considerable experience, it is found that the best silk velvet is most suitable for the purpose. The body of the roller is of pear-wood, a light material most favorable to the purpose, while the handles are of box-wood. Over the pear-tree block are sewn two layers of thick serge, and over the latter one thickness of velvet, the price of which is about 12*s.* a yard. A nice brisk nap is required in the velvet, and this cannot be obtained unless a good price is given. The serge, before it is sewn on, should be scalded in hot water, so that it will not ruck afterwards, and the velvet must be fitted by a skilled seamstress. The so-called carpet stitch is best adapted to the purpose, the ends of the velvet not overlapping, but drawn together so as to meet. In this way the seam is not a ridge, but perfectly flat, and the roller does not set-off at this spot. It need scarcely be said that this can only be attained with very fine stitches. The velvet is cut out exactly to size, and sewn on the block. The velvet roller is ready for use as soon as it is made. Unlike the leather roller, there is no need to get it into condition. In the same way, it may be put away in its linen bag as soon as done with, though, perhaps, it is best to clean first; the bag keeps away dust, and the grease in the ink will keep the velvet from becoming hard. Of course you can't scrape a velvet roller, to get the ink off, as you do a leather one; you can only free the velvet of its ink by rolling. The roller is passed over a clean slab, and this is scraped from time to time. The slab gradually pulls the ink off, and this is then removed from the slab by scraping. If you are not able to get off all the ink in this way, pass the roller over a thin sheet of soft paper, and apply a little turpentine. After a little practice, you will soon know when the roller is free from ink."

gelatine is very much facilitated by adding chloride of calcium to the sensitive mixture. The following answers very well: —

Gelatine	6 parts.
Water	60 "
Bichromate of ammonia	1 "
Chloride of calcium	2 "

Printing surfaces thus obtained, whether lithographic or typographic, resemble those of Pretsch or of Dallas on the one hand, and those of Sprague on the other hand.

In speaking of the work done by Messrs. Sprague & Co., in which the gradations of the original photograph are translated into a vermicular grain, suited for printing by means of the litho-machine, one must fully recognize the fact that this firm was the first to put photo-mechanical printing from the ordinary gradated negative on a large commercial basis in this country; while the great extent and variety of work executed by them during the last two years abundantly proves that there is a large and rapidly extending field for work of this kind. Before you are numerous examples of their work, and in the extensive commercial application of this method we have a very decided advance since the date of my previous lecture.

In order to obtain a transparency in which the tints are translated into points, lines, or dots, Algeyer and Bolhoevener have recently suggested a method in which a collotype plate is exposed under a negative; and after this plate has been soaked and inked up in the usual way, the fatty image is reinforced by dusting with an opaque powder. This method is of course dependent on the reticulation of the gelatine for the production of a grain. From such a transparency a negative may be made by contact printing, and from this a photo-litho transfer by any one of the well-known methods.

Meisenbach, of Munich, has recently obtained a patent, in which he claims some details as to well-known methods of breaking up the grain of a photograph by means of a network, and he more especially claims the shifting of the network during the time of exposure. As regards this point, something similar was described by Bertschold in the volume of the *Photographic News* for 1859. Notwithstanding the fact that one cannot find any very striking features in the patent of Mr. Meisenbach, this gentlemen has produced some typographic blocks of surprising excellence, examples of which are now before you.

Having now touched on a few stray points, we come to an important feature in connection with the subject, that is to say, the direct translation, by mechanical means, of the gradations of depth existing in the Woodbury relief into corresponding shades of stipple or granulation; but before entering into these, let me call your attention to a method of granulating the relief itself, which Mr. Woodbury has made the basis of a method by which excellent printing blocks have been made.

Mr. Woodbury exposes his ordinary relief tissue under a transparency with a piece of network interposed, the effect of this being to produce a decided grain all over the high portions of the resulting relief, and no grain over the deep parts, intermediate portions being grained to an intermediate extent. A reverse cast from the grained relief thus obtained is the printing block. This mode of procedure is subject to one disadvantage in actual practice, as the various printing parts of the resulting block do not lie accurately on one plane, as is the case with a block made by etching a plate of zinc into relief. Mr. Woodbury, however, informs me that he has recently overcome this objection, by a modification of the process in which a transfer is obtained directly from the relief. The specimen before you will show what good work this method is capable of yielding.[1]

Mr. Fred. E. Ives, of Philadelphia, published in 1878, a method of translating the smooth photo-relief into stipple, and this method may be regarded as a new departure. According to the method of Ives, as described by him in 1878,[2] and patented in the United States, the essential features of his method consist in inking the Woodbury relief, and pressing against paper which has been grained or embossed, somewhat after the fashion of bookbinders' cloth. Under these circumstances the projections on the paper become completely crushed down by the inked relief where the gelatine is thickest, and a solid black results, while the more shallow parts of the relief only tip the projection on the paper with ink. Intermediate thicknesses of relief produced a medium effect. You will now please note the effect of pressing this sheet of grained paper against the inked Woodbury relief, a picture in black and white resulting, the shades of the original being represented by the varying extent of the closely packed dots which constitute the picture. The translation into stipple thus obtained may be used as a transfer for putting down on stone or zinc, but if preferred, it may be re-photographed. Ives also made printing blocks by casting from the grained surface which had been compressed by the gelatine relief, although these were not found to be quite equal in quality with those obtained by the first mentioned method. A subsequent modification of Mr. Ives's method gives results much more easily and economically, as he has succeeded in substituting a "swelled gelatine" relief for the more expensively produced Woodbury relief. In a letter to me, Mr. Ives says: — "The relief which I now employ is a plaster cast from swelled gelatine, which is secured so easily that an apprentice seventeen years of age makes them acceptably for Crosscup and West. On the relief the lines and stipple are impressed by means of a printing film of elastic V-shaped stippled lines, in a manner which gives the operator considerable control of the effect. The line and stipple picture on the plaster relief is then stripped off for lithographic transfer or etching, by a method so simple and perfect that it astonishes all who see it done. Formerly, I had to reproduce the impression by photography in the camera, and by this operation could not avoid losing much of the delicacy of the original, which is wonderfully delicate, sharp, and clear in line. I have to secure ruled plates for moulding closer lined printing films before I can apply the transfer method of reproduction for fine work; so it may be months before I shall show you what fine results I can secure in this way."

The broad principle of the Ives method, which consists in pressure of the relief against a grained or stippled surface, has been the subject of several subsequent patents and inventions. We find that in 1879, Petit, of Paris, took out an English patent for a method nearly identical with that of Ives, and soon after another patent by Dredge followed; this latter, however, indicating novel methods of working. A process of quite a similar character is the "Crayontype" of Ad. T. Eggis, which was published in the *Photographic News*, a short time ago. Mr. Eggis, instead of inking the relief, takes an inked film, such as manifold copying paper, and lays this on the relief. The grained paper is now placed over and pressure is applied. If the grained paper sold for producing crayon effects in lithography is used, very excellent transfers are obtained. Mr. Barker will illustrate the process to you.[3]

Other modes of effecting the translation of the relief by pressure on grained surfaces have been patented by Mr. Zuccato, and some of these will be demonstrated to you by Mr. Barker.

The first method consists in first planing a piece of type metal or similar surface in a series of ridges, or a series of pyramids, as the case may be. The plate is then inked, and instead of pressing the relief directly on the inked plate, a piece of very thin paper is interposed; the relief crushes down the pyramids in proportion to its depth. The pyramid of type metal is spread out, and forms a sharply cut outline on the paper, and in this way a transfer is obtained which has a remarkable clearness of outline, almost like the cleanest cuts of the graver.

It will illustrate the matter better if, instead of inking the plate first, the relief is pressed directly against it, and you will then be able to see the flattening of the lines or pyramids.

Two other modes of working have also been patented by Mr. Zuccato. In one he interposes between the relief and a sheet a transfer

[1] The following quotation from Woodbury's specification of 1873 will serve to fully elucidate the nature of the process referred to: — "I prepare sheets of bichromatized gelatine such as is used in the process called 'Woodburytype,' and expose these under a photographic positive to the action of light, but interposing between the positive and the gelatine film a transparency on collodion or mica, of what is known as mosquito netting, Brussels net, tulle, and so forth, which has the effect of breaking up the resulting relief into a multitude of fine square hexagonal lines; or for some subjects I interpose a transparency on mica or collodion of any design of a similar nature that will have the same effect, such as an impression from a grained stone, or the same from a number of fine ruled lines. The sheet of gelatine, when washed, will give a relief having the positive photograph represented by a number of lines, instead of the simple half-tone it originally possessed; I then take an impression from this by means of hydraulic or other pressure in any soft metal, and use the block so obtained for printing at a type press where only a few copies are wanted; but where large numbers are required, I electrotype the same in the ordinary way. I prefer to use diffused daylight or sunshine through ground glass or tissue paper to produce the relief, as in that case the light in the parts that represent the white creeps round the lines, thus partially obliterating them in that part, and leaving them strongest only in the parts printing dark. I sometimes adopt another method. I take a negative of the network by transmitted light, and copy this together with the negative to be reproduced, thus producing a positive with the lines already thereon, from which I proceed to make a relief and blocks, as stated."

[2] The following reprint of Ives' original declaration will be of interest: — Ithaca, N. Y., Aug. 12, 1878. I, the undersigned, have, to-day, invented a method of obtaining relief plates for the typographic printing press, from ordinary photographic negatives, which may be described as follows: — 1st. From an ordinary photographic negative, a relief in gelatine, similar to that used in the Woodburytype process, but perhaps in lower relief, is obtained. 2d. This relief is carefully and uniformly inked with fine printers' ink, and pressed between two flat surfaces (or between rollers), against paper or other material, upon which is stamped, or otherwise produced, a fine grain, or other suitable surface. The inked relief being highest in the black parts, presses down the grain of the paper on the corresponding parts, and the removal of the ink by the paper from those parts of the relief produces a black impression, while upon those parts where the relief of the gelatine is lower, the grained surface is pressed less, and the ink taken up in spots, the size of which depends upon the grain of the paper, and the amount of pressure, and producing an effect similar to that of crayon sketches made upon such a surface. 3d. Relief plates may be made from this impression, either by the usual photo-typographic processes, or, perhaps, by obtaining a cast or electrotype of the impressed surface of the paper or other material used to receive the impression from the gelatine relief. — Fred. E. Ives.

[3] Mr. Eggis, writing in the *Photographic News*, thus describes the method: — "This process gives results good enough to have allowed the taking of a patent, but I find it preferable to describe it for the public benefit. I call it crayontype, for the images it produces are much like those obtained by the artist with a lead pencil (crayon in French). This is how I proceed. I procure or produce, to begin with, a gelatine positive on best plate glass (*glacé*) obtained by the known ways, in relief. The highest point, when dry, should not have more than one millimetre. The other necessary implements are — 1st, grained (or lined) paper, of same kind as is used by the artists for their drawings destined to be etched; and a few sheets of blue or black transferring paper (*papier à calquer*, thin paper coated with a greasy substance and colored); 3d, a small press. Having these at hand, I take the gelatine positive, lay it on the stone or metal table of the press; on the relievo I place a sheet of transferring paper, the prepared face turned upwards. On this I lay the stippled or grained autographic paper, face downwards, touching the greased sheet. Over all this, I place a fine polished steel sheet, well planed. I put the whole under the press, and slowly pull down the lever in such a manner as to give a smooth and graduated impression. Afterwards separating the whole, I find on the grained paper a good and often a perfect stippled reproduction of the gelatine relief. This reproduction being formed by a greasy substance, I am able to transfer it at once directly on stone, for lithographic purposes, or on metal, to be etched in the usual manner. The production of such an image will be easily understood; it is much the same as the direct drawing with a pencil on the paper. Instead of the artist pressing more or less his graphite on the paper, the gelatine relief (which corresponds more or less to the lights or shadows of the photo) presses more or less on the paper, and gives the true gradation of the original. The work of the hand is mechanically imitated very closely indeed. The crayontypes present a different grain, which may be chosen according to the work to be done. It is at least more artistic than the usual regular stippling."

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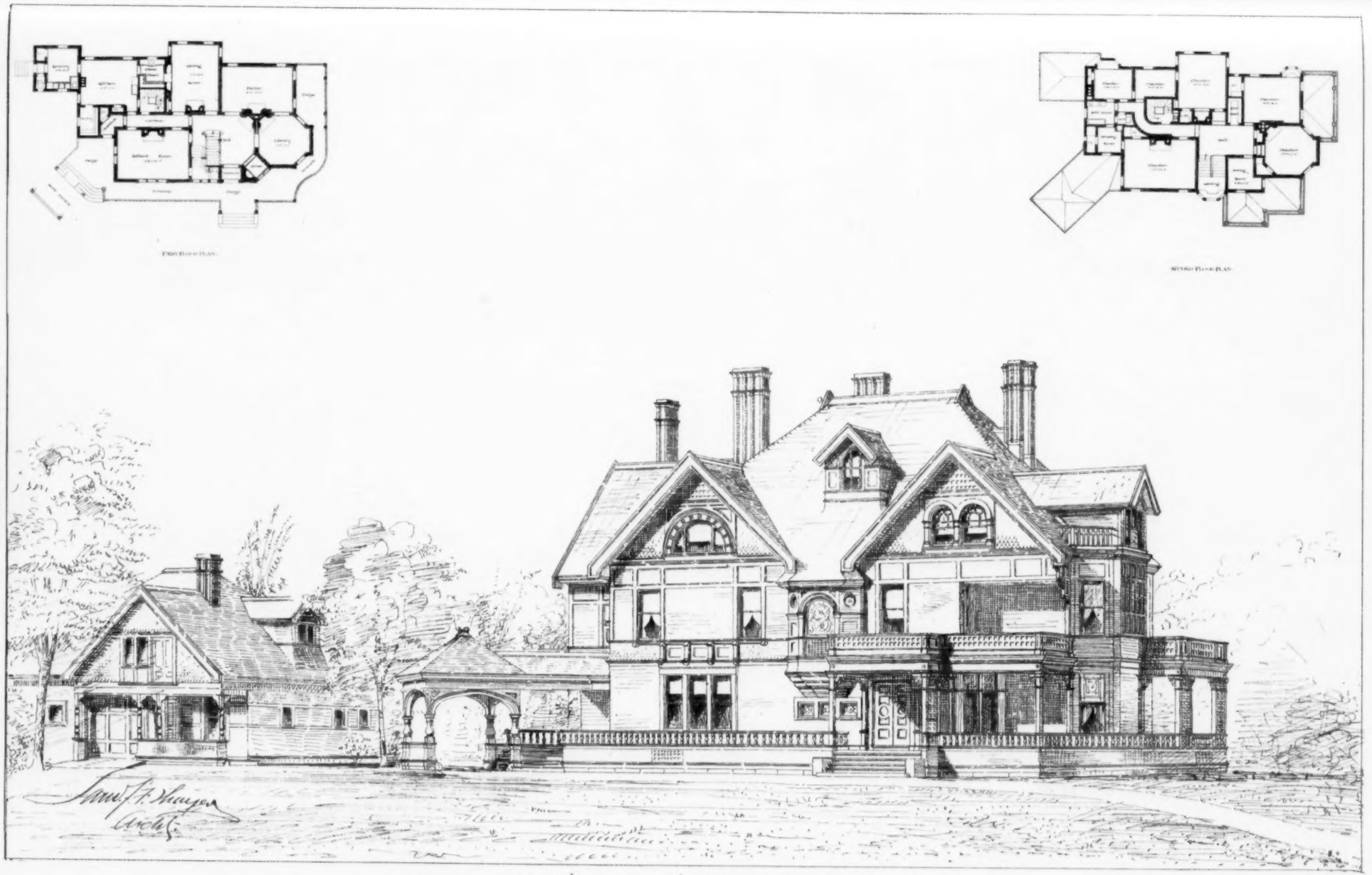

House and Stable at Newton Mass. for Mrs Lizzie Brooks.

HELIOTYPE PRINTING CO. BOSTON

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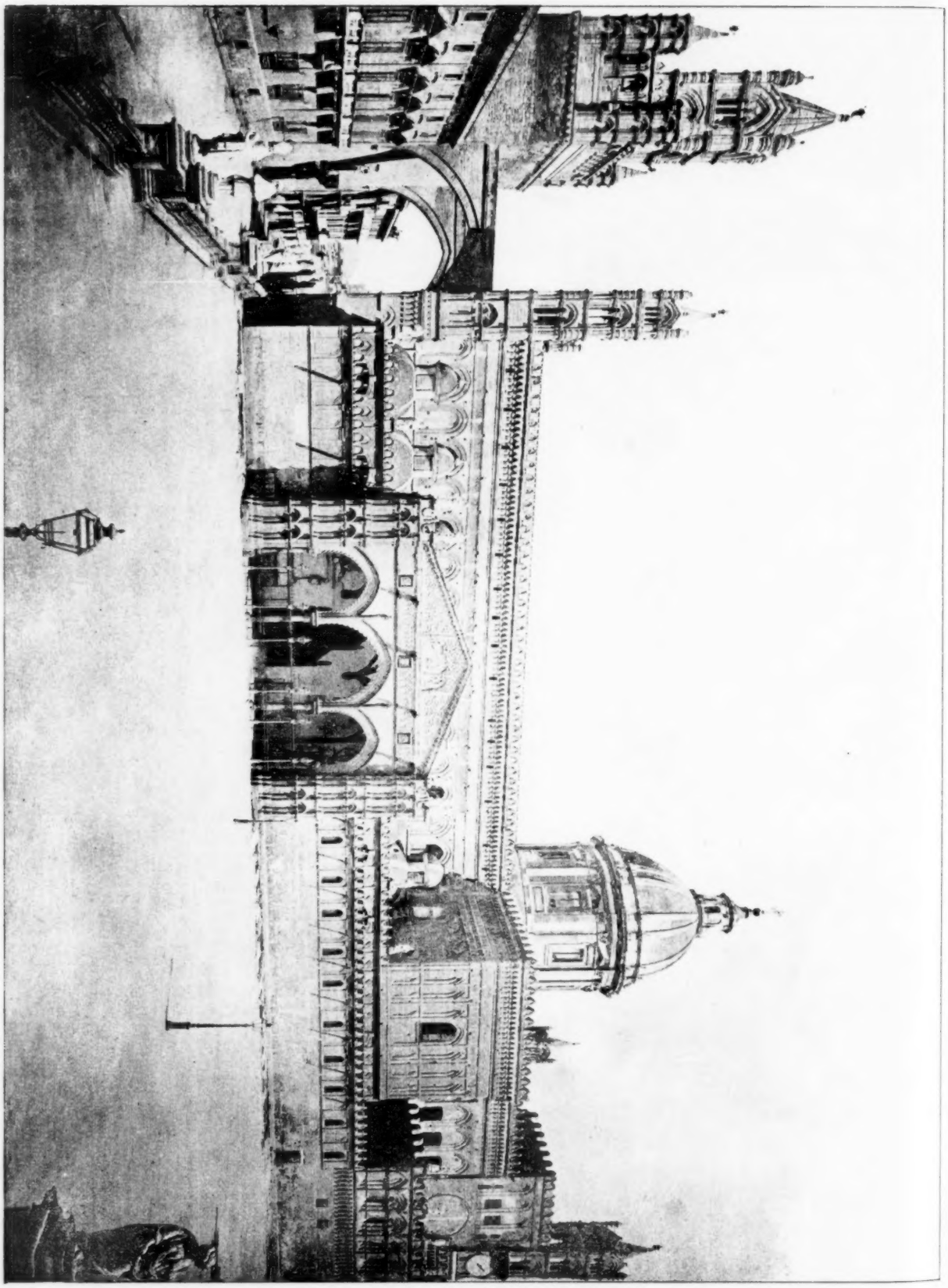

CATHEDRAL, PALERMO, SICILY.

PHOTO-AQUATIC HELIOTYPE PRINTING CO., BOSTON.

COPYRIGHTED, 1884, JAMES R. OSGOOD & CO.

House of Col. Stevenson, Blue Hill, Readville, Mass.

Mr. W. Ralph Emerson, Arch't.

Pencil Sketches by Mr. Waldo Dean.

Principal Entrance.

Alcove with table & seat in one of the Bedrooms.

HELIOTYPE PRINTING CO. BOSTON.

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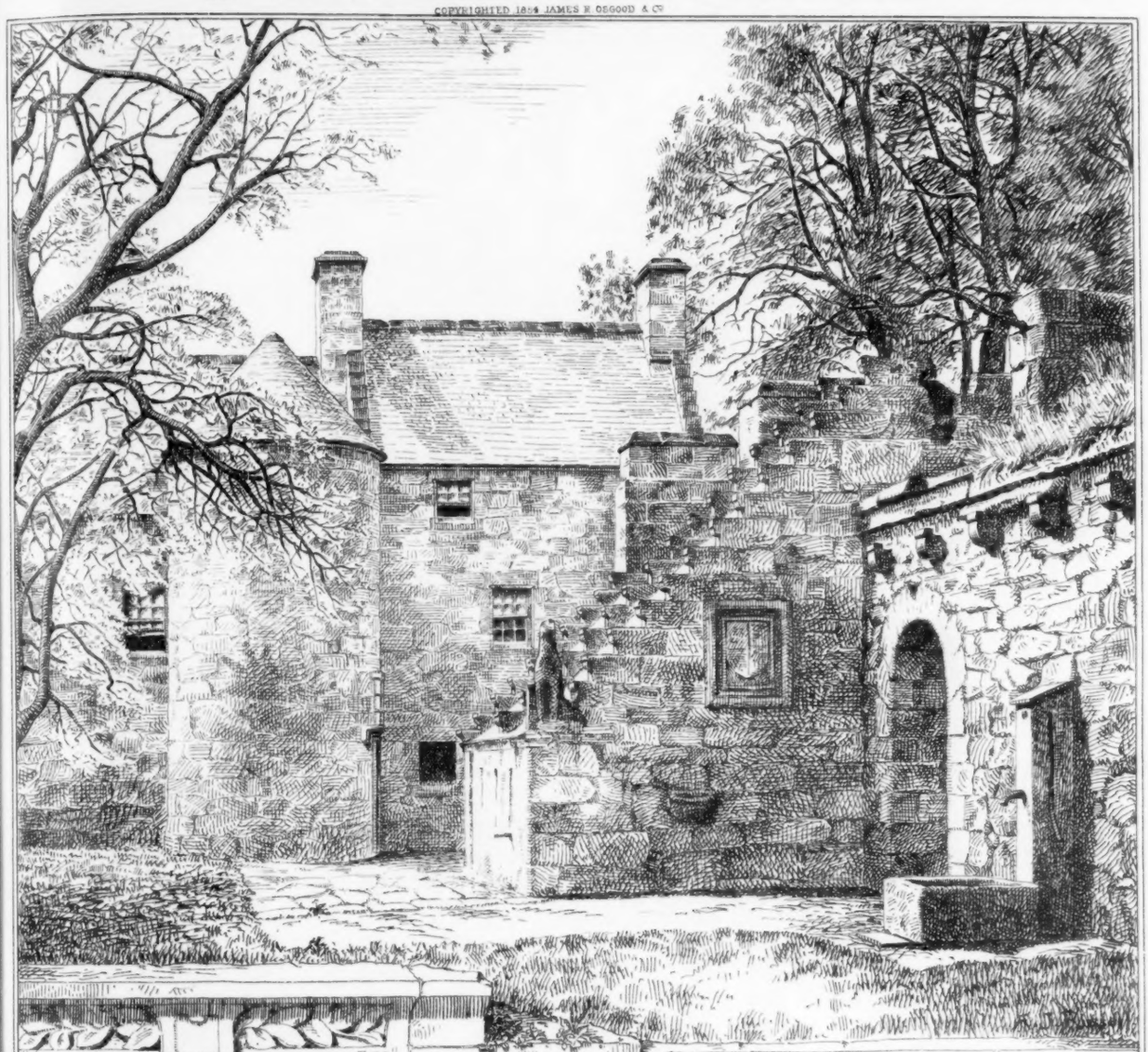
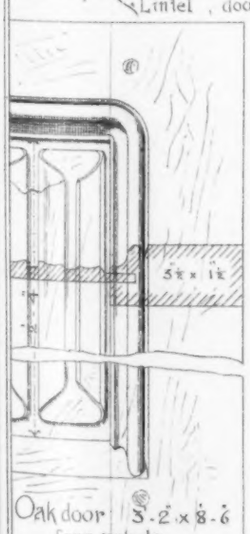
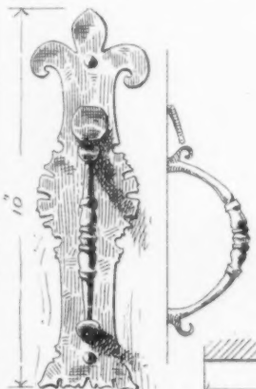


CRAIGNETHAN HOUSE.
LANARKSHIRE.
SCOTLAND.

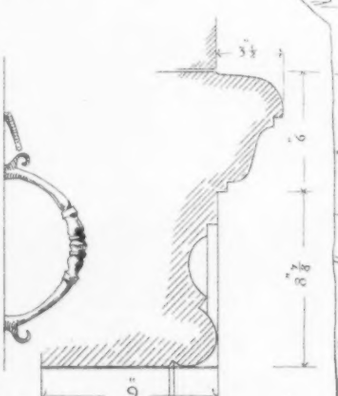
Lintel, doorway in out-house.



Oak door 3-2 x 8-6 four panels.



Door Latch, forged iron.



Jamb & Label. Door in staircase tower.

HELIOTYPE PRINTING CO. BOSTON.

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HOUSE ON PROSPECT AVE., MILWAUKEE, WIS.
ALEX. F. OAKEY, ARCH'T. 129 E. 42ND ST. NEW YORK.

ABBEY CHURCH OF THE HOLY TRINITY AT CAEN.

Arches under the central Tower looking from the South Transept

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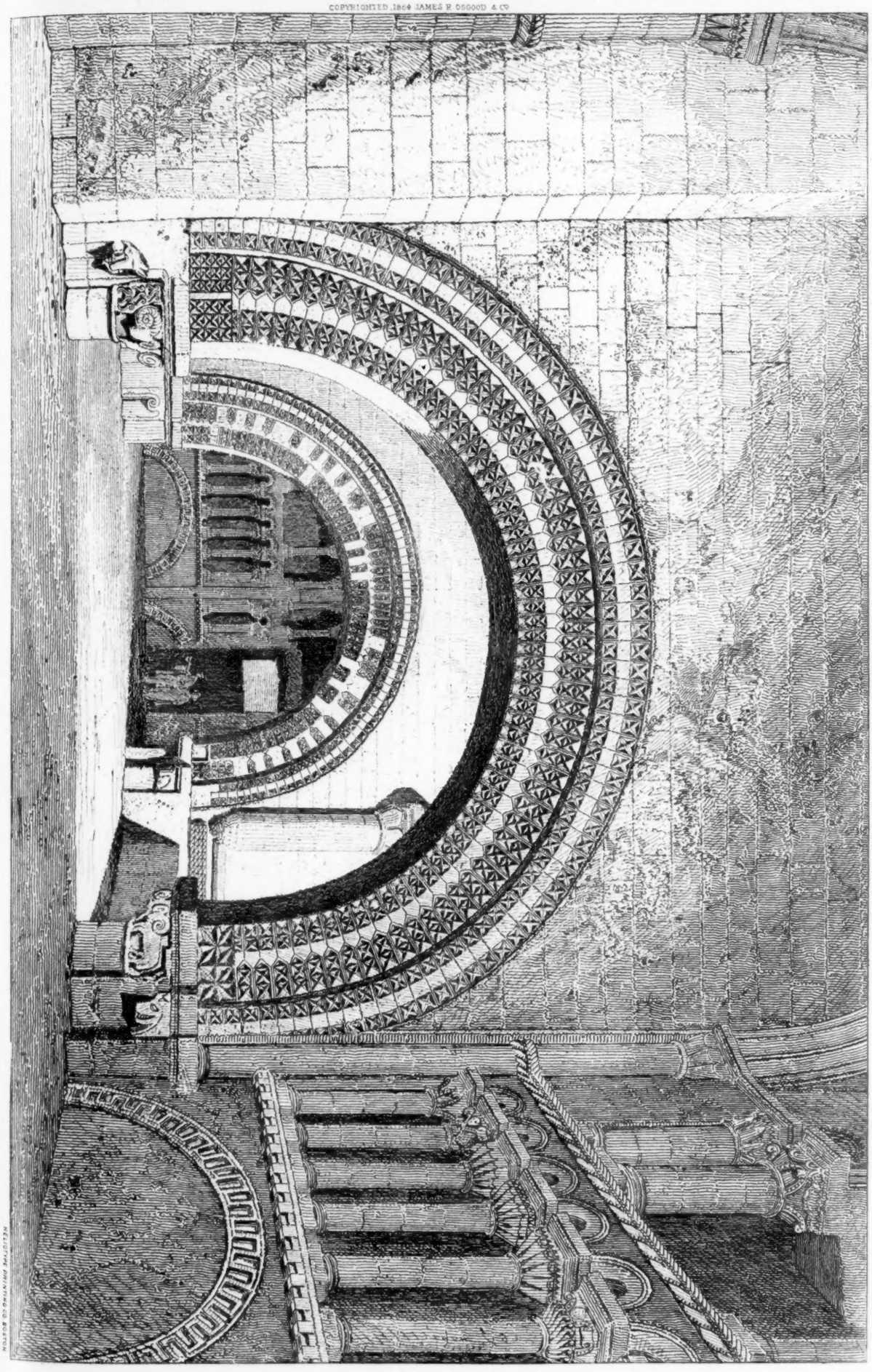

ABBEY CHURCH OF THE HOLY TRINITY AT CAEN.

HELIOTYPE PRINTING CO. BOSTON

paper a piece of gauze, or a piece of silk which has been inked with transfer ink. Of course what then takes place is similar to what happens in the case of the plate; the threads of the gauze get crushed out to a greater or less width, but this method in which the gauze is crushed down is not nearly so perfect as the method with the plate of type metal.

A third mode of working, which Mr. Zuccato also claims in one of his specifications, is the pressing of the relief upon a lithographic or zincographic surface on which an ink stipple has been impressed. The stipple gets crushed out more or less, according to the extent of the pressure; this of course depends on the thickness of the relief.

Messrs. Brown, Barnes, and Bell, of Liverpool, have recently made some excellent blocks, and, judging from the appearance of the prints, they appear to me to be likely to have been produced by some method more or less resembling the Ives' process; still I have no knowledge on this point. These gentlemen have made certain patent claims, but as various methods are referred to, one cannot judge from the specifications as to what process is actually employed.

Before you go, perhaps you will look at some reproductions of phototype blocks, which Mr. P. Barry has made by casting in brass. The details are wonderfully preserved, but it does not appear to me that this process of reproduction is likely to supersede electrotyping.

THE ILLUSTRATIONS.

THE CATHEDRAL, PALERMO, SICILY.

A DESCRIPTION of this building, accompanied by one of Mr. A. H. Haig's masterly drawings, showing the campanile of the archbishop's palace and the arches separating it from the cathedral front seen from the opposite direction, may be found in the *American Architect* for April 27, 1878.

ABBEY CHURCH OF THE HOLY TRINITY, CAEN, FRANCE.[1]

For description and further illustration, see our last issue.

HOUSE AND STABLE FOR MRS. ELIZABETH BROOKES, NEWTON, MASS. MR. S. J. F. THAYER, ARCHITECT, BOSTON, MASS.

CRAIGNETHAN HOUSE, LANARKSHIRE, SCOTLAND.

DETAILS FROM THE HOUSE OF R. H. STEVENSON, ESQ., MILTON, MASS. MR. W. R. EMERSON, ARCHITECT, BOSTON, MASS.

Other details from this establishment were published in our last issue.

HOUSE AT MILWAUKEE, WIS. MR. A. F. OAKEY, ARCHITECT, NEW YORK, N. Y.

ART IN CHALDEA AND ASSYRIA. — IV.[2]

Refrigerator exhibited at
The Boston Mechanic's Fair:
by the Baldwin Manf Co: Burlington Vt
Case designed
by Frank Hill Smith

WE have thus cast a hasty glance at the principal characteristics of Mesopotamian architecture. We have seen how its main structures were built, and also recognized the existence of a subordinate and contrasted style of architecture in which the column was used, — a style, as M. Perrot thinks, that was evolved from the tent, and that ran its independent course parallel with that of the main fashion, uninfluenced and uninfluencing. We must now pass over some of M. Perrot's interesting chapters, — those on the orientation of buildings and their foundation ceremonies, and the mechanical resources and the graphic processes of the time, — and look very briefly at the funerary architecture of the Chaldeans and Assyrians. The palace is the best-preserved and most interesting structure left to us; not as with the ancient empire of Egypt the tomb, and not as with later Egyptian and with Greek developments the temple. We are far indeed from finding any sepulchre to compare with the mighty pyramids, or those later Egyptian tombs whose pictured walls unroll for us the story of local life in all its ranks, in all its beliefs, and in all its practical details. "We know," says M. Perrot, "hardly anything of their tombs. Chaldean tombs have been discovered in these latter years, but they are anonymous and mute. We do not possess a single funerary inscription dating from the days when the two nations who divided Mesopotamia between them were still their own masters. *As for Assyrian burial-places, none have been discovered.*" It is a strange but most indisputable fact that no one to-day has the slightest idea how the Assyrians disposed of their dead. Texts and monuments and sculptured pictures are all alike silent. There is no witness to prove how the body was disposed of when life was extinct, not with regard to the sovereign more than with regard to his humblest subject; no tombs, no urns, no writings, no testimony of any kind. Loftus suggests that all bodies were taken to Chaldea, since in this latter country cemeteries are as conspicuous as in Assyria they are lacking. The southern country was regarded as sacred by the northern, as being the birthplace of its race, and this fact gives color to the theory; but, as M. Perrot queries, would the Assyrians have confided the corpse of their almost deified monarch to the untender mercies of a nation with whom they were unceasingly at war? The whole question must be left unsettled for the present.

The Chaldeans evidently held something akin to the Egyptian belief with regard to the nature of the soul, and the necessity of preserving the body after death. This is proved by Assyrian writings, and by the careful way in which their tombs were built. The bodies were mummified, though not so perfectly as the Egyptian, since the skeleton alone remains to-day. We find no funerary mounds in Chaldea. The dead were interred in small brick vaults, under terra-cotta lids, or in terra-cotta coffins of varying shape. These coffins, however, were heaped one upon another, so that with the lapse of years they themselves grew into mounds. No sepulchre has as yet been discovered which stands out by its size or richness as being that of an important personage, and yet certain inscriptions, if such testimony were needed, tell us that royal tombs did have a conspicuous existence.

The Assyrian temple has already been briefly referred to as the "staged tower." Some of these towers have been called "observatories," but there is no proof that they were not all temples; and, indeed, the two functions may very well have been combined in Mesopotamia. The most typical form is a seven-staged tower formed of cubes decreasing in size, placed each in the centre of the one below, unbroken by any interior apartments, crowned probably with a plinth or tabernacle, and encircled by either one or two sloping ramps for ascent or descent. For a description of the variations of this type which have been catalogued, the reader must turn to M. Perrot's words, and to the admirable, discreet, and conscientiously explained restorations of M. Chipiez. The great mound called Birs-Nimroud was a temple, and it still stands to the height of 235 feet. Strabo says it once measured over 600 feet, but M. Perrot deems this an exaggeration. It is certain that none of the temples yet discovered attained the bulk of the great pyramid of Gizeh. Remains of these temples have been found at ancient Ur and other Chaldean sites, as well as in later Assyria, and the Chaldean examples are the largest.

Smaller buildings that evidently were temples have also been discovered. Sometimes they showed the columnar structure to which I have already referred, but sometimes they were merely brick houses of not excessive size (the naos in one at Khorsabad measures about 47 feet in length), decorated after the customary fashion with sculptures and enamelled bricks. The bas-reliefs show that the triangular pediment was not unknown among their forms of roofing.

We cannot follow M. Perrot through the full and interesting description he gives of Sargon's palace at Khorsabad. It has already been many times referred to, and a very general idea is all that a review can give, even though it be extended to undue length. Other Assyrian palaces are all of a similar type, though no two are identical in plan. Sargon's is the most instructive because it stands alone on a site unoccupied before and untouched later, while in other places successive builders have left conflicting traces, one having often mutilated the remains of him who had built at an earlier day; for each Assyrian monarch erected his palace for himself, as the Egyptian did his tomb, and none was content with the legacy of his predecessor. Often old materials were converted to new uses, as we see in the sculptured slabs, which are sometimes worked on both sides with pictures of different dates, the later comer having turned the first face to the wall and placed his records on what had been the hidden side. Certain ancient Chaldean ruins have been partially uncovered which show that the same palace-type prevailed through all ages. And later Babylon confirms the belief; that is, in so far as she speaks through written history: for the river has destroyed her in part, and what is left has not been properly explored. A great harvest probably awaits the investigator who shall open the three or four great mounds that still stand on the site of Babylon, looking still like natural hills, and shall excavate them as fully and scientifically as M. Place has done with the palace of Sargon.

All Mesopotamian cities were thoroughly fortified, but again we must pass over M. Perrot's interesting analysis. It is hardly necessary to add that Babylon and probably other cities were of enormous circuit, uniting within their walls, most likely, many separate towns

[1] From Cotman's "*Antiquities of Normandy.*"

[2] *A History of Art in Chaldea and Assyria.* from the French of Georges Perrot and Charles Chipiez. Illustrated, translated, and edited by Walter Armstrong, B.A. London: Chapman & Hall, New York: A. C. Armstrong & Son, 1884.

Continued from page 222, No. 463.

or villages, large gardens, and even cultivated fields, to afford sustenance in case of siege. Each entrance through the town walls was in reality a succession of rooms, hollowed out of the enormous thickness. They were of two kinds at Khorsabad, the simpler showing outside only ornament in colors, but the more splendid those huge animals and winged genii that are familiar to the frequenter of European museums. Paved and elevated causeways extended from these gates and formed roads across the plain as well as streets within the town. At Khorsabad the streets were forty feet wide. M. Place could not entirely excavate the remains of the small town, but did enough to know that such remains exist below the present surface. Of the houses of the private Assyrian citizen we know very little, but the bas-reliefs show us that they must have had both flat and domed roofs.

I have barely touched upon the most important points in M. Perrot's survey of Mesopotamian architecture, and yet I have been led beyond my original intentions. I have been tempted on by the fact that his book is the first that has explained the subject in a thorough way; that has united the testimony hitherto dispersed through a number of costly volumes, each devoted to a special site; that has collected the evidence given by all recent explorers, and has woven all their new-gained knowledge into one coherent story. We may be doubly grateful for his labor since the form of his book puts it within reach of every student. And now we must look very briefly at the art of the Mesopotamian sculptor.

Its beginnings are more obscure than we found them in Egypt. Only a few fragments dating from very early days exist, — only just enough to show that the art had an independent origin and was not derived from that of Egypt, and that a school existed which carefully studied nature and was successful in its treatment. But there was no such incentive here to faithful naturalistic work as there was in Egypt. Though similar ideas prevailed as to posthumous life, no sepulchral statues seem to have existed in Chaldea. The strong impulse toward careful portraiture they gave in Egypt was lacking in Mesopotamia, so when we come down to that period when our materials are most abundant — to the Assyrian empires — we find an art that is powerful in many ways, but limited in its range, monotonous in its subjects, and extremely conventional in its treatment of the human form and face. Perhaps, however, the chief reason for this last characteristic lies in the fact that the Mesopotamian sculptor lived among a people who did not go half-clothed like the Egyptians, or entirely naked like the Greeks upon occasion, but who were covered with voluminous drapery. History tells us, moreover, that these Eastern folk, unlike the Greeks, thought it shameful to uncover the body. Opportunity and impulse were thus alike wanting for that constant study of the nude which can alone preserve an art in the path of true and powerful portraiture. We may believe that if these conditions had been different the sculptor would have produced very different work when he treated the human body; for no art whatever has treated animal forms with such artistic truth, such majesty, and such vital, expressive force. Another consequence of these conditions, taken together with the soft quality of the stone employed, is that the sculptor's art soon restricted itself almost entirely to bas-relief. Semi-detached figures are frequent, but entirely detached subjects seem to have been more and more abandoned as the ages passed; and the true bas-relief is the chief product of the school. Its principles were admirably understood. Examples occur in which the figures occupy two planes, but a single plane is the most common device. Even in the later days of the school when, as always in such days, the sculptor tried to do too much at once, he still did not violate the principles of his process as his brethren have done amid more modern nations. He had a true artistic instinct to guide him in the selection of important facts, and to counsel the omission of those that were relatively useless. Naturally, the relief is higher where the figures are of larger size, but it is never more than mezzo-relievo, and the true basso-relievo of extremely slight projection is the best-beloved expedient. The Greeks preferred mezzo-relievo, and low relief was never again so frequently, understandingly, and beautifully employed as it was by the Assyrians until the early Renaissance sculptors of Italy again perceived its charm.

In the lions and human-headed bulls that guard the gateways we find a very peculiar compromise between "the round" and the relief. Looked at from the front they seem independent figures, the heads, chests, and forelegs standing out with freedom; but seen from the side they are reliefs, partly engaged in the visible slab behind them. A most peculiar device was adopted to make them seem complete from either point of view. Each was given *five* legs. Two are seen placed close together in front, and the animal appears at rest; but at the side we see four legs so placed that he is walking. The device is, however, as rational as it was bold and, so to say, unnatural. Only thus could both aspects have been made life-like and effective, and, as M. Perrot declares, many a one might look often at such a figure without perceiving the anomaly; it is only from one point that an oblique view reveals all five legs at once.

In Assyrian bas-reliefs, as in Egyptian, the faces and feet are almost always in profile and the bodies full front. Even on occasions where the full face is shown the feet retain their awkward profile; but the effect is hardly as disturbing as in Egyptian work, since the voluminous draperies partly conceal the deformity. One or two types — a bearded face and a smooth face — include between them all the faces on these reliefs. All the kings look alike, and all their bearded attendants bear something more than a family resemblance to them. Royalty is denoted by costume and dominating height, without any attempt at definite portraiture; and the type is the same that was handed down to the Assyrian by his Chaldean predecessors. The whole genius of the art is conventional as far as renderings of humanity are concerned; but, as I have said, it is very different when we come to look at animal forms. Here the sculptor's power was not hampered, and he proved it to be great indeed. The magnificent mastiffs, the horses, the wild asses, the lions and lionesses are rendered with a keen insight, a fiery force, and a skill in seizing upon essentials and omitting unessentials which could not be overpraised. The captive lion stepping proudly from his cage, or the wild one writhing wounded but defiant, is a creation which alone would entitle the art which produced it to rank with the world's great developments. There is one figure of a wounded lioness, her hindquarters paralyzed by an arrow which sticks in her spine, that is an unsurpassable masterpiece of action, character, and feeling. The lion hunt of Assurbanipal found at Nineveh and now in the British Museum proves what the Assyrian sculptor might have done with human forms, had circumstances favored him as they favored the Greek.

At Nimroud (now Callah), the earliest seat of the Assyrian monarchs, and at Khorsabad, which was built by Sargon, the first king of the second dynasty, the figures on the reliefs are very large, filling the whole height of the slab, and measuring more than nine feet; but later on, the slab was divided into seven or eight parallel compartments, and the figures are of small size. This was a consequence of the growing desire to enliven and vary the severe monotony of the earlier style, to introduce a greater number of figures, more indication of backgrounds, and a greater diversity of incident; but throughout the whole art it is marked by what seems to us great monotony. We find the same scenes of battle, of worship, and of hunting repeated over and over again with similar figures similarly disposed. There never was a time when any one but the king was thought worthy of being perpetuated in art. There is nothing to be found even remotely approaching in character to the reliefs and paintings in which the Egyptian artist depicted the real life of the nation. Assyrian sculpture was as conventional in its themes as, so far as humanity is concerned, it was conventional in its treatment.

The colossi which flanked the entrances are so well known that I need hardly dwell further upon their characteristics here, especially as there is no space to give M. Perrot's interesting analysis of the meaning attached by the Assyrians to those curious combinations of man and beast that so often occur. M. G. van Rensselaer.

THE KIND OF ARCHITECT WHO CANNOT GET ON.

His father was the vicar of a small country parish, and, the church requiring restoring, he thought it a good opportunity to make terms with the eminent architect who conducted that nowadays thankless operation for the professional education of the subject of our sketch. The anxious father was moved thereto by several considerations. First of all, young hopeful had missed the scholarship which was to have smoothed the way to a university career, and had disconcerted all the family plans thereby; and, secondly, the good vicar was taken aback at the, to his thinking, ample remuneration which the fashionable architect received for a few slight drawings and a casual visit or two — an amount which contrasted sharply with the very moderate stipend which rewarded his own ministrations. He was, moreover, dazzled by the long list of similar commissions which the professional gentleman had on hand, and upon which he expatiated with off-hand volubility. And so the preliminaries were discussed and settled, the premium paid (not without a pang), and the young man, duly articled for three years, left his country home for the office of the great London architect, carrying with him the hopes and fears of his impoverished parents. He was not badly equipped for the profession selected for him. He had received a fair education at the local grammar school; his breeding and his home life in an English parsonage had given him the manners and bearing of a gentleman, and his father's position might reasonably be counted upon for an introduction to the superior clergy and the county families.

His reception in the office of the master of the building arts was not quite what he expected. In the first place, his principal was rarely seen. The important commissions he had on hand, and the still more important ones he had in view, kept that accomplished artist running about the country a good deal. His office business was conducted by one scantily-remunerated, but trusty clerk, of tried fidelity, skill and experience, and of untiring industry, assisted by a number of pupils, who did as little and absented themselves as much as possible. The new pupil was taught nothing. He picked up the simple but showy art of tracing, and he copied specifications. In response to the importunate clamors of sundry clerks-of-works, he adapted to new circumstances some stock details which had done similar duty on several occasions, and he compiled some wonderful

specifications by a process of selection from a store of originals. In neither of these occupations did he take any real interest, nor did either of them afford any suitable opportunities for his advancement. The *rationale* of the art he was supposed to be acquiring was never explained to him, and he knew but little at the end of his three years' apprenticeship that he did not know at its commencement. The excellent aids to study which the ingenuous youth of the present day has at command did not then exist, and if they had existed, our friend had not the energy to avail himself of them. When the day of his emancipation arrived, which his friends certainly thought would have brought with it a secure and honorable position in his employer's office, or a crop of cathedrals to restore, or churches and parsonages to build, they were surprised to learn that there was no longer room for him in the office. He was "pushed from his stool" by a newer crop of pupils, who were about to pass through the same course of "study." In this predicament he tried various devices. He failed to find an entrance to the offices of other architects. His friends with one accord recommended him to "set up for himself," to "start upon his own account." To their innocent minds this seemed like securing fortune by a sort of *coup-de-main*.

He took a dingy office in the Adelphi, very high and airy, and he added his name to the long list on the door-posts, garnished with his professional titles; and he soon discovered that "setting up" and "starting" were not quite the same thing. He did not "start," but "stagnate." It was very dull, sitting alone in that dingy apartment waiting for the clients who never came, and soon those little leaflets which grow on many an office-door began to show themselves, bearing dates which could not be reconciled with the confident statements as to the immediate return of the tenant. The young gentleman was meanwhile consorting with other young gentlemen similarly conditioned, who railed on Lady Fortune in set terms, and could not for the life of them make out how it was that the Scotts, and Streets, and Waterhouses of the period got all the work. This state of things was brought to a sudden close. The youth returned to his ancestral home, whence he was driven by the death of his father, and the consequent disruption of his home. A compassionate friend found him office-room and a pound a week, as a temporary measure. This asylum failed him after a short time, and then his path in life led undeviatingly downwards. He had no qualifications for the battle of life. He was not even a draughtsman in any sense of the word, and could not subsist on that "charing" which has formed for so many young men the bridge from clerkship to independent practice.

That "able assistance" which is so very easy to obtain, *vide* advertisements, was not his to give. Pen-and-ink perspectives of the effective sort he could in no wise prepare. The designs which he once undertook to furnish "from the rough sketches" of a distant and deluded employer were returned to him with a scornful letter, rougher than the sketches. Of all practical knowledge he was quite innocent. "Quantities" had always been so repugnant to him that he never fully understood the meaning of the word, and was certainly unacquainted with the operations involved in their preparation. He could not have written an intelligent specification to save his life, and to price or criticize a builder's account was not to be thought of. He could trace what was drawn for him and copy what was written, and these he could do but "indifferent well." There is but a limited demand for such arts as these, and the remuneration they command is but trifling. And thus it came to pass that he fell into disgrace and poverty, and kept out of the way of those friends whose patience and purses he had long since exhausted.

There are but few architects in town who have not recently suffered a call from one or another of the numerous specimens of this class. The type varies but little, and one portrait will serve for the whole. He has no card, but sends in a name; a very good one, of course. The office-boy delivers it with mysterious reserve, but cannot enter upon explanations in the hearing of the caller, who is close upon his heels. The embarrassment he manifests is variously interpreted by his master; it may mean another vicarious application for that little account, and the professional gentleman is perturbed at the thought and at the impossibility of retreat — offices are generally so badly planned. Or it may be a new client; hope springs eternal in the human breast, and this delusive suggestion gains a decisive victory. The stranger is admitted, and his whole story is read at a glance; it is an oft-told tale. His costume is mainly noticeable for new and ingenious adjustments; his bearing is either offensively servile and his address a whine, or he puts on the easy swagger of a familiar friend. Has Mr. Blank a vacancy in his office? Unfortunately, no; things are flat. It is found by the visitor to be so in other quarters; even the great Mr. Friba cannot offer him employment. Will Mr. Blank kindly look at a few drawings? At this juncture Mr. Blank suddenly recollects a very important engagement; but his retreat is cut off, and, before he can escape, the dirty package is untied and some dirtier drawings displayed. Poor things enough! Designs for a country school, or something of the kind, culminating in a pen-and-ink perspective ludicrously out of drawing, with inhuman figures more preposterously ill-drawn still. A short lecture is delivered thereon, with the volubility of frequent repetition. It appears that they were submitted in competition, but "of course a local man got the job," etc.

The conversation, or rather monologue, takes a sudden turn in the direction of certain irregularities in the matter of daily meals: of the absence of breakfast on that particular morning, on many previous mornings, and finally settles down upon the immense relief which would follow the temporary — merely temporary advance of half a crown. Sometimes the appearance of the applicant is a sure indication of the real cause of his misfortunes. In the saddest cases ability is not wanting, only the ability to keep away from the establishment at the corner. And there are cases where the failure to keep a footing in the crush and crowd of modern life is not culpable. As the American Æsop wisely says in his modern version of the fable of the tortoise and the hare, "the race is not *always* to the slow." We have exact information as to at least one instance in which merit is but inadequately rewarded. Nevertheless a specialist can always get a living of some sort; an artist will always find a market for art; a practical man can at least find employment as a clerk-of-works. If luxury cannot be attained, no one able and willing to work need despair of modest comfort. But woe to those who fail to qualify for some branch of the great profession which they adopt. As the world is more and more, the individual certainly becomes less and less; he drops out of the crowd and is lost sight of. As the years go by, the descent into Avernus becomes increasingly easy, and it is now more than ever necessary for those to bestir themselves who are ambitious even to keep their foothold; doubly so for those who would "get on." — *The Builder.*

A PICTURE MANUFACTORY.

IN a certain town of the North, and in one of its principal streets, may be seen a large picture dealer's warehouse. The quantity of the work shown is very large in proportion to its quality, and as there are still some latent doubts in the mind of the dealer as to the authenticity of his works, it has been advisable, to soothe his feelings and to direct and improve the wavering public taste, to affix to each work a placard to its purport; plain, decisive, and concise: "An oil painting, warranted. Signed. Price 45*s*. Frame worth as much." Every afternoon there is a sale by auction, and curiosity had taken us there on more than one occasion. The idea came to one of our correspondents one day to make the acquaintance of this man of many pictures; so the following morning, having armed himself with a small landscape (a castle made weird and phantom-like by fog), he strolled leisurely into the shop. The work was uncovered, and criticism indulged in. "Well, sir, from an artist's point of view, this is, no doubt, a very fine picture; from mine it is not worth a ——. We want something with plenty of flash color; crude green, and brilliant reds, with an appearance of finish, which is got by using very thin color, and putting plenty of small touches, to imitate flowers in the foreground. We want no hidden sentiment, all must be on the surface, and the more superficial it is the better it sells. What do the public want with castles hid in fogs? Their ideas, what with family matters and business, are always in that state, and they want a little sunshine to refresh them. Something decorative to make a bright spot in a room. And this is what we strive to give them."

"Well," we asked, "is much to be made by this kind of art?"

"A great deal. An American artist came over to this country some two years ago, and he has already put £1200 by. Do you see that picture there?"

There was no mistaking it; it was a vermilion sunset, with a spot of crimson lake for the sun; a few besoms, with their handles stuck in the ground, were standing out in bewildering relief. "That is something like a picture! Sells well, and three like that can be painted in a day, and the artist gets £1 a piece for them. I pay him £60 a month; and he in a course of two years will paint two hundred or more like that one."

"And do you make a big profit?"

He seemed to think we were chaffing him or thought him "green," and did not answer; from which circumstance, we may judge, he lives in clover. His confidence in the judgment and appreciation of the public was limited.

"Judge a picture?" said he. "Do they judge music? Do they like any picture if the artist's name is unknown, or a critic has not said 'Admire it, it is splendid.' I say no. Music to most ears must be noise, harmonious or otherwise, providing there be a tune; a picture to most eyes must be flash, startling, and crude; of the higher branches of both, they form their judgment by the opinion of others. I do business also in Paris; for though they talk more of the high walks of art than in our matter-of-fact country, my pictures find a market — sell well, ha! ha! sell very well."

And this is in the nineteenth century, and in the days of Oscar Wilde! *Sic itur ad astra!* — *The Artist.*

MECHANIC'S LIENS FOR ARCHITECTS.

NEW YORK, November 5, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—In your last edition, in answer to inquiry of correspondent, you say, "The precedents vary in different States; in New York it has been decided that the lien laws are not intended for the benefit of architects," etc.

The General Term of the Superior Court in 1877 rendered such a decision as you mention, but this decision was reversed, upon appeal, by the Court of Appeals, in January, 1879, and judgment given to the plaintiff (the architect). This decision is reported in 76 New

York, page 50. It is also reported in 32 American Reports, 262, and is discussed in 21 Albany Law Journal, 405. We have heard of nothing later than this. If the decision you refer to is of later date, you will confer a favor if you will kindly send us such particulars as you may have of such later decision. Yours truly,

HUBERT, PIRSSON & Co.

[We are very much obliged for this correction. The case mentioned is probably the same as that to which we referred, and the reversal of the decision of the inferior court, by the highest State court, is of great importance to architects. — Eds. American Architect.]

BRACKETS.

To the Editors of the American Architect: —

Dear Sirs, — Can you kindly direct me to an illustrated article or chapter on brackets, their form and construction.

Respectfully, A Subscriber.

[For good forms of brackets, look at any architectural dictionary, under the word "console." For additional forms, some good and others not, the illustrated American books on house-carpentry and village architecture will furnish a variety.—Eds. American Architect.]

NOTES AND CLIPPINGS.

A Perilous Pathway. — The travels of the native East Indian explorers, their stratagems and their disguises, their hazards and sufferings, their frequent hair-breadth escapes, are teeming with excitement. One of them describes a portion of his track, at the back of Mount Everest, as carried for a third of a mile along the face of a precipice, at a height of fifteen hundred feet above the Bhotia-kosi River, upon iron pegs let into the face of the rock, the path being formed by bars of iron and slabs of stone stretching from peg to peg, in no place more than eighteen inches, and often not more than nine inches wide. Nevertheless this path is constantly used by men carrying burdens. — *Scientific American.*

The Radiating Power of Metals. — M. Walter Meunier has, according to the *Revue Industrielle*, been experimenting on the comparative loss of heat from cast-iron, wrought-iron and copper tubes. The experiments were carried out in a room having a uniform temperature, and were made simultaneously with the three materials in question. The tubes were all 2.5 metres long and 150 millimetres in diameter, connected at one end with a steam supply, and at the other with a worm condenser in water. Observations showed that the weight of water condensed per square metre of heating surface per hour was, with naked pipes, 3.484 kilograms for the cast-iron, 3.906 kilograms for the wrought-iron, and 2.816 kilograms for the copper. The non-radiating power of copper in comparison with iron is thus manifest. It is not stated, however, whether the pipes were all of equal thickness and similarly polished, or left with their natural surfaces. It is to be understood, perhaps, that identical conditions were, as far as possible, preserved.

The Hildesheim Treasures.— The museums of Germany bear witness to the dominion of the old Romans. From Buda-Pesth to Treves, from Cologne up to the higher Rhine, the earth has yielded of the conquering race buried arms, helmets, coins, bronzes and marbles. Yet, for the most part, the relics in the outlying provinces of the empire are of more archæological curiosity than art value. An exception, however, must be made in favor of the Hildesheim treasure, removed to Berlin in accordance with the policy of concentration in the capital. This "Silberfund," consisting of some fifty pieces of banqueting plate, were in 1858, by happy accident, dug up at Hildesheim, nine feet below the surface, by a party of Prussian soldiers engaged on military works. All the objects had suffered much from the burial of centuries; handles and feet were torn from shattered vases, but a local sculptor succeeded in good degree in piecing the fragments together. Some members, however, are lost beyond recovery. Altogether I find the originals in Berlin in very different plight from Christofle's reproductions, which serve as poor consolation to the town of Hildesheim for the treasures of which she has been robbed. The Hildesheim treasures have provoked controversy without definite conclusion; neither history nor internal evidence gives clue to their precise origin or use. The place of burial could only have been an accident, and hardly more than a conjecture is the statement that this table plate, with the corresponding culinary utensils, formed part of the equipage of some Roman general, who, on reverse of fortune, hid away the prize he could not hold. The nationality of some of the pieces is questionable; all are not Roman, and equally is the chronology hypothetical. The official catalogue I believe to be wrong in giving as the date the early Roman Kings; certainly some vases — that, for instance, bearing on the surface human heads, as the Warwick vase — belong to the late empire. And nothing can be more false than the assumption that because all the objects were found in one place they must belong to the same time; diversities of style alone prove the lapse of several centuries between the earliest and the latest. And still more difficult to determine is the precise or even the approximate period of burial. The common conjecture that the hiding was in the first decade of our era, when the Roman legions under Varus were cut to pieces in Germany, is disproved by the presence of an art posterior in date. The earliest time I can venture to name is the second century, but the latest possible date cannot be fixed; it is just as easy to suppose the owner to have been a connoisseur of the Middle Ages as a Roman general. Fortunately, as to art merit, little question can be raised; so irresistible was the temptation to throw articles in the precious metals into the melting-pot, that few finer relics of the past are preserved for our times. By common consent the best of the Hildesheim treasures are of rare beauty; the proportions share symmetry with Greek vases; the ornament in the treatment of figure and foliage, if a little florid, still comports sufficiently well with the canons of classic art. — *The Nineteenth Century.*

The Seine below Clichy. — A recent investigation, the results of which are published in the *XIXe Siècle*, shows that from the point where the Paris drains enter the river at Clichy the aspect of the Seine is that of a moving mass of vegetation, like the "sudd" of the Upper Nile, only that it is full of putrid matters not found in Egypt. This "sudd" almost interrupts the course of the river, and converts it into a morass of mud. The odor arising from the "water" is indescribable. At St. Denis the horrors culminate. "The river — if the name can still be given to the depository before us— boils under the action of the gases arising from it. Lumps of filth rise from the bottom and come to the surface, suddenly exploding and forming circles on the water, quickly effaced, but incessantly repeated. The Seine is nothing but an immense fœtid mass of putridity formed by chemical decomposition, the surface of which, all boiling with globules, shines in the sun."

The American Church in Paris. — A serious impediment, says a correspondent of the *Guardian*, has arisen to the completion of the handsome church which the American Episcopalians are building in the Avenue de l'Alma. It has now been in the course of erection for about two years, and was expected to be ready for provisional use by Christmas, and to be finally inaugurated by Easter next, at the latest. Now, however, an unexpected obstacle has occurred, which will greatly delay these intentions. It appears that a Jura marble of a too fragile description has been used for the clustered shafts which support the pier arches of the nave. The consequence has been that these columns have proved unequal to the support of the superincumbent weight of the edifice, and have begun to crack and splinter under the pressure imposed on them. The whole building has been obliged to be shored up with wooden arches and ponderous beams placed under the pier-arches, while ten at least of the clustered columns of the nave will have to be removed and replaced by a more solid material. The expense and labor attendant upon such an operation will be very great, and the time required will probably delay the completion of the church at least six months beyond the date anticipated. The difficulty will, no doubt, be met and overcome; but its occurrence, and the prolongation of the work, will prove a serious strain upon the energies of the highly-esteemed rector, Dr. Morgan, who has been already so long and anxiously occupied in the completion of the enterprise, and now sees his expectations disappointed just as they seemed on the point of fulfilment. One can only heartily wish him safely through these new difficulties. Some time ago, when looking over the church, it was pointed out to the correspondent as a more correct style of Gothic construction that the segments of the columns were much longer, and therefore more perpendicular, than was the case in similar French architecture. And certainly, French builders generally form their columns of very short segments, and in the case of Classical buildings, like the Madeleine, of circular blocks hardly thicker than a millstone. The effect of so many joinings is not agreeable to the eye; but the solidity attained, both as to resisting pressure or even a slight shock, is much greater. The too great length of the segments of the columns in the above case seem to have been one cause, perhaps, why the marble had not been able to bear the strain which was put upon it.

The Most Expensive City in the World. — New York (writes a correspondent to the London *Times*) has become the most expensive city in the world, except, perhaps, St. Petersburg, of which I know nothing. A modest house for a small family in a respectable locality cannot be had for less than £200 to £600. In the enormous "flat" houses which are rapidly going up all over the upper part of the city, an apartment of seven or eight rooms, in nowise luxurious, costs £200 to £400, and in less eligible localities, and most moderate in pretension and accommodation, rarely less than £100. At a well-known commercial restaurant I lunched off the joint the day before yesterday, and with a pint of cider and a cup of detestable black coffee my lunch cost me 6s., and was in nowise equal to the half-crown lunch of a London restaurant. The beef that is sent from here to England and sold at 6d. to 10d. a pound costs us here in New York twice that, the fillet 4s. per pound, and everything in proportion. A style of living which in London costs £1,000 a year, here will cost £2,000. The large profits are met by proportionate expenses. A man grows reckless of the dollars. At the hotels you not only pay enormous bills, but the greed of the attendants makes it impossible to get decent service without continually tipping them, and not in the modest way one does in England. There is no charge made for service, but if you want your lunch served quickly and well you must fee the waiter when you give the order. He marks every *habitué* who tips him or who does not, and the tips are on the American scale — anything less than a "quarter" (a shilling) is contemptible, and the true American will never consent to be contemptible even in the eyes of a waiter. He will at all costs avoid the reputation of meanness and has little inclination to distinguish between meanness and economy, and being always in a hurry to get back to business says that he loses more than a shilling by the delay which the waiter imposes on him. At the hotel the guest who does not fee in advance soon finds the zeal of the waiters falls off. I stopped three days at a fashionable hotel lately, and found that the second day my energetic waiter of the first found occupation at another table, and that of the second day failed me on the third, on which day I was attended by a decrepit old fellow, whom on leaving I tipped for his self sacrificing spirit, as he must have known I did not fee the others. You pay a bootblack a dime (5d.), and so on to the end of the list. And we have no suburbs to cheapen life in. The Hudson River blocks us on one side with its uncertain winter navigation; and Brooklyn, across the East River, is as dear as New York. I was offered a furnished flat of seven moderate rooms there for £25 a month. And everybody is so intent on his own getting on that he does not stop to think that this system of enormous profits for everybody eats up all his surplus gains: and a man who gets £500 a year here is no more comfortable than a London clerk at £250. There is the chance of a great hit, and he believes in his luck. And the devotion to business is certainly phenomenal. If it is wise and healthful, the future will tell better than to-day.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

307,437. PNEUMATIC DISPATCH-TUBE. — Henry Clay, Philadelphia, Pa.

307,439. CLAMP. — Philip F. Corbett, Boston, Mass.

307,440. BENCH-DOG. — Thomas Crispin, Detroit, Mich.

307,451. MIXED PAINT.—Wm. D. Folger, Calcutta, India.

307,453. VISE-JAW ATTACHMENT. —Edward A. Galbraith, Boston, Mass.

307,456. FIRE-EXTINGUISHER. — Frank Gray, New York, N. Y.

307,459. REFRIGERATOR AND REFRIGERATOR-BUILDING.— Jos. F. Hanrahan, Ottawa, Ontario, Can.

307,471. MIXING-MACHINE FOR ASPHALT, CONCRETE, ETC. — Wm. H. H. Knight, Washington, D. C.

307,496. RADIATOR. —Joseph W. Shaw, St. Louis, Mo.

307,499. HEATING-APPARATUS. — Sidney Smith, Cambridge, Mass.

307,507. RATCHET-DRILL. —Chas. E. Tunellius, Chicago, Ill.

307,519. CALCIMINING AND WALL BRUSH.—Henry Bintz, New York, N. Y.

307,520. WATER-CLOSET. — William Bunting, Jr., Boston, Mass.

307,526. VENTILATING-ATTACHMENT FOR WATER-CLOSETS.—Minford S. Clark, Brooklyn, N. Y.

307,545. BOLT. — Charles E. Hart, New Britain, Conn.

307,551. STAIRS.—Peter H. Jackson, San Francisco, Cal.

307,558. STREET-BOX FOR GAS AND WATER SERVICE.— Edward Lindsley and Chas. E. Lindsley, Cleveland, O.

307,575. SASH-HOLDER.—Obadiah G. Newton, Trenton, Mo.

307,585. DOOR-HANGER. — Isaac B. Perry, Knoxville, Tenn.

307,586. BEDDING-STRIP FOR STONE-MASONRY, ETC.—George R. Phillips, Providence, R. I.

307,590. SHEET-METAL ROOFING-PLATE. — Patrick H. Regan, Nashville, Tenn.

307,593. LOCK-HINGE.— Chas. E. Robinson, Brooklyn, N. Y.

307,617. GRAINING COMPOUND. — Hezekiah Bailey and Wm. H. Bailey, St. Thomes, Ontario, Can.

307,660. BURGLAR-ALARM.—Peter Keffer, Reading, Pa.

307,668. WATER-CLOSET.— Wm. H. McAndrews, Bradford, Pa.

307,675. LUMBER-MEASURE. — Earl C. Newton, Batavia, Ill.

307,688. SELF-CLOSING HATCHWAY. — Richard D. Thackston, St. Louis, Mo.

307,711. BRUSH.—Oren Fish, Cleveland, O.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report nineteen permits have been granted, the more important of which are the following: —

W. J. Clendinen, 6 three-st'y brick buildings, n s Preston St., between Bond St. and Broadway.

Jos. M. Coue, 13 three-st'y brick buildings, s s Harlem Ave., between Brune and Fremont Sts.; 3 three-st'y brick buildings, e s Fremont St., s of Harlem Ave.; 11 three-st'y brick buildings, s s Harlem Ave., between Brune and Chatsworth Sts., 3 two-st'y brick building, e s Brune St., s of Harlem Ave.

Jacob Gisriel, three-st'y brick building, w s Argyle Ave., n of Pitcher St.

John Murray, 3 three-st'y brick buildings, s s George St., between Brune St. and Clinton Ave.

Wm. Carback, 2 two-st'y brick buildings, w s Chapel St., s of Eager St.

Boston.

BUILDING PERMITS. — *Eustis St.*, n Albany, Ward 20 3 brick dwells., for W. F. Collins, 21′ x 40′, flat; W. F. Collins, builder.

B. & A. Railroad, passenger station, Ward 25, brick depot, for B. & A. R. R. Corporation, 30′ 2″ x 75′ 10″, pitch; Norcross Bros., builders.

Vale St., Ward 21, for Dennison Mf'g Co., brick manufactory, 42′ x 115′, flat; D. H. Jacobs, builder.

King St., bet. Elmwood and Roxbury Sts., brick stable, 30′ x 52′, flat.

Brooks St., Ward 23, J. M. Baker, wood dwell., 12′ x 15′ and 20′ x 26′, pitch; J. M. Baker, builder.

Wheelock Ave., n Hancock St., Ward 24, A. P. Wheelock, wood dwell., 21′ x 32′, pitch, E. H. Hubbard, builder.

Carouth St., n Van Winkle St., Ward 24, wood dwell., 5′ x 10′ and 21′ x 25′, pitch; Edw. Beal, builder.

Maywood St., n Blue Hill Ave., Ward 21, Henry Walker, 2 wood dwell., 19′ x 15′ and 23′ x 40′, flat, Pinkham & Russell, builder.

Washington St., n Codman Pl., Ward 21, Patrick F. Sennott, 2 wood dwells. and store, 20′ x 39′, flat; M. Sullivan, builder.

Goldsmith Pl., Nos. 3-11, Ward 19, for S. Goldsmith, 7 wood dwells., 20′ x 45′, flat; S. Goldsmith, builder.

Atwood Ave., Ward 22, for Andrew Cassidy, 2 wood dwells., 21′ 6″ x 30′, hip; A. Cassidy, builder.

H St., Nos. 147-149, for Ward 14, J. B. Howe, 2 wood dwells., 20′ x 34′, flat; Holbrook & Harlow, builders.

East Ninth St., No. 506, Ward 14, Lyman Locke; wood dwell., 18′ x 33′; flat; L. Locke, builder.

Metropolitan Ave., n Poplar St., Ward 23, for A. Fox, wood dwell., 11′ x 14′ and 16′ x 26′, pitch; Jno. Alden, builder.

Cambridge St. cor. Harvard Ave., Ward 25, for Isaac Dearborn, 3 wood dwell., 24′ x 26′, flat; G. W. Adams, builder.

Adams St., cor. River View Ave., Ward 24, L. H. Brown, wood dwell., 14′ x 20′ 6″ and 22′ x 34′ 6″, pitch.

Corey St., n Walnut St., Ward 25, for Catherine Smith, wood dwell., 8′ x 12′ and 28′ x 30′, pitch; Geo. A. Spear, builder.

Washington St., n Norfolk St., Ward 23, for Enoch A. Carter, wood mechanical building, 18′ x 22′, pitch; E. A. Carter, builder.

Duncan St., n Greenwich St., Ward 24, Thos. Lundrigan, wood dwell., 14′ x 16′ and 23′ x 29′, flat; E. Merville, builder.

New Alburn St., cor. Palm St., Ward 23, for S. Murphy, wood dwell., 24′ x 30′, flat; S. Murphy, builder.

Brooklyn.

BUILDING PERMITS. — *Columbia St.*, e s, 170′ n Cole St., three-st'y brick store and tenement, tin roof, wooden cornice; cost, $5,000; owner, Mr. Burke, on premises; architects, M. Freeman's Sons.

Bergen St., Nos. 111 *and* 113, 2 three-st'y brick dwells., slate roofs; cost, each, $4,500; owner, Thos. H. Robbins, Keyport, N. J.; architect, Amzi Hill; builder, E. K. Robbins.

First St., e s, 60′ s South Second St., 3 four-st'y brick tenements, felt, cement and gravel roofs; cost, $20,000; owner, Chas. J. Dodge, 146 Keap St.; architect, E. F. Gaylor; mason, James Rodwell; carpenters, Marinus & Gill.

Fourth Ave., w s, 50′ 2″ s Thirty-seventh St., three-st'y frame tenement, tin roof; cost, $4,500; owner, Hugh Crawshaw, Jersey City, N. J.; architect, S. B. Bogert; builder, John H. O'Rourke.

Greene Ave., s s, 360′ e Bedford Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $6,500; owner, etc., W. L. Dan, 117 Pulaski St.

Sumpter St., n w cor. Stone Ave., two-st'y frame dwell., tin roof; cost, $2,350; owner, James W. Keveny, 238 Keap St.; architect, Louis F. Schillinger; builder, John Dohlman.

Vanderbilt Ave., e s, 235′ n De Kalb Ave. two-st'y brick stable, tin roof; cost, $3,200; owner, J. Cox, 392 Clinton Ave.; architect, E. M. Howe; builders, W. Buckley and Miller & Howe.

Leonard St., e s, 30′ n Devoe St., four-st'y frame factory, tin roof; cost, $8,000; owner, John E. Anderson, 302 Ewen St.; builder, Chas. Vincent.

Troutman St., n s, 230′ e Evergreen Ave., three-st'y frame tenement, tin roof; cost, $4,250; owner, Edward Hechinger, 128 Troutman St.; architect, Frank Holmberg; builders, Jacob Muller and Fred. Stemler.

Lee Ave., s w cor. Lynch St., three-st'y frame store and dwell., tin roof; cost, $3,500; owner and carpenter, W. H. Cook, 69 Lynch St.; mason, H. Bruchhauser.

Seventh Ave., n e cor. Eighth St., 4 two-st'y and basement brown-stone dwells., and one three-st'y brown-stone dwell., tin and wood roofs; cost, four $5,000 each and one $8,000; owner, Charles Long, 450 Ninth St.; builder, J. F. Wood.

Bleecker St., s w cor. Evergreen Ave., three-st'y frame tenement, tin roof; cost, $4,500; owner, Edward Monahan, Sr., 11 Bleecker St.; architect, Fred. Weber; builder, Jacob Schoch.

St. Mark's Ave., No. 263, n s, near Underhill Ave., two-st'y brick dwell., tin roof; cost, about $4,000; owner, W. M. Lane, on premises; builders, Smith Wood and Richard Bennett.

Bedford Ave., s e cor. Halsey St., 5 three-st'y stores and flats, gravel roofs, wooden cornices; cost, each, $5,000; owner, etc., D. H. Fowler, 14 Verona Pl.

Middleton St., s s, 85′ e Marcy Ave., three-st'y frame tenement, tin roof; cost, $3,500; owner and builder, Philip Bossert, Wall St., near Bushwick Ave.; architect, John Platte.

Union St., s w cor. Seventh Ave., three-st'y and basement livery-stable, gravel roof; cost, $10,000; owner, B. C. Hollingsworth, 651 Warren St.; architect, Frances Ryan; builder, Matthew Ryan.

Ninth St., s s, 30′ w Gowanus Canal, two-st'y frame storage of coal, board roof; cost, $6,000; owners, Chas. Pratt & Co., 44 Broadway, New York; architect and builder, D. E. Norris.

Herkimer St., s s, 250′ w Utica Ave., 3 three-st'y brick dwells., tin roofs, wooden cornices; cost, each, about $2,500; owner and builder, Geo. W. Lung, 20 Utica Ave.; architect, Chas. E. Hebberd.

Stockton St., Nos. 322-326, s s, 400′ e Sumner Ave., 3 three-st'y frame tenements, tin roofs; cost, each, $4,500; owner, Cath. Straub, 11 Lewis St.; architect, Th. Engelhardt; builder, Geo. Straub.

First St., e s, 60′ s South Second St., 3 five-st'y brick stores and tenements, felt, cement and gravel roofs; cost, each, $10,000; owner, Chas. J. Dodge, 146 Keap St.; architect, E. F. Gaylor; builders, James Rodwell and Marrinus & Gill.

ALTERATIONS. — *North First St., No.* 107, n s, 60′ w Third Ave., add two and three stories; cost, $4,000; owners, J. W. Mathison, 107 and 109 North First St.; architect, E. F. Gaylor.

Seventh St., n s, 100′ e Sixth Ave., propose to cut out a well-hole and put in platform stairs, also lower gallery; cost, $5,000; owner, Park Congregational Church; architect and builder, C. B. Sheldon.

Chicago.

BUILDING PERMITS.—S. H. Emery, 3 two-st'y dwells. 228-230 South Paulina St.; cost, $6,000.

Evangelical Church, one-st'y church, 97-103 Ambrose St., cost, $2,500.

L. H. Eames, six-st'y store, 320-322 Wabash Ave.; cost, $40,000; architect, Halberg.

W. S. Johnston Estate, four-st'y store and flats, Chicago Ave., cor. Wells St.; cost, $45,000; architects, Cobb & Frost; builders, Angus & Gindele.

C. J. Kavanagh, 2 two-st'y dwells., 962-964 West Monroe St.; cost, $7,000; architect, D. E. Greene; builder, Wm. H. Hancox.

J. Nelson, three-st'y dwell., 207 North May St.; cost, $6,000; architect, P. H. Anderson; builders, Lund & Gilbert.

Mrs. Barbara Titus, 3 two-st'y dwells., 355-359 Vernon Ave.; cost, $13,500; architect, B. Rae; builders, Geo. Lehman & Co.

Mrs. Barbara Titus, 6 two-st'y dwells., 3300-3308 Rhodes Ave.; cost, $26,000; architect, R. Rae; builders, Geo. Lehman & Co.

Mrs. Barbara Titus, 8 two-st'y dwells., 111-117 and 120-126 Thirty-third St.; cost, $36,000; architect and builders, same as last.

Mrs. Barbara Titus, 6 two-st'y dwells., 626-630 and 356-660 West Harrison St.; cost, $25,000; architect and builders, same as last.

Mrs. Barbara Titus, 5 two st'y dwells., 527-529 and 970-972 West Jackson St.; cost, $22,000; architect and builders, same as last.

Mrs. Barbara Titus, 2 two-st'y dwells., 153-155 Laflin St.; cost, $8,000; architect and builders, same as last.

Geo. Bender, two-st'y dwell., 588 Robey St.; cost, $4,000; architect, J. Clifford; builders, Mowat & Crawford.

P. Kipley, three st'y store and flats, 477 Twenty-sixth St.; cost, $6,000; architect, Ackerman; builders, Goodrich & Bro.

C. L. Jenks, seven-st'y store and office-building, 125 Van Buren St.; cost, $28,000; architect, C. Chapman; builder, B. Cullen.

C. W. Boynton, 3 three-st'y dwells., 183-187 North Morgan St.; cost, $12,000; architect, H. M. Hansen; builder, C. W. Warren.

W. A. Giles, two-st'y additional, 300-304 Wabash Ave.; cost, $6,000; architect, F. K. Schock; builders, Barney & Rodatz.

Miss J. Walsh, two-st'y dwell., 391 South Oakley St.; cost, $2,500.

W. W. Phelps, 5 two-st'y dwells., 80-84 Eda St.; cost, $10,000; architect, W. A. Furber; builders, Angus & Gindele.

C. F. Rakebrand, three-st'y flats, 285-289 Fremont St.; cost, $9,500.

American Express Co., freight-house, 222-226 Van Buren St.; cost, $25,000.

Shoenman & Bro., three-st'y cooling-room, Archer Ave.; cost, $5,000.

L. Silverman, 8 three-st'y stores and dwells., 3543-3587 Cottage Grove Ave.; cost, $30,000; architect, Oscar Cobb; builder, A. Lanquist.

Newberry Estate, one-st'y addition to warehouse, 117-119 Kinzie St.; cost, $3,000; architect, F. A. Wascher.

S. E. Gross, 12 cottages, Gross Terrace St.; cost, $20,000; builder, S. E. Gross.

Mrs. C. McCormick, six-st'y warehouse, 214-220 Market St.; cost, $75,000; architect, A. M. F. Colton; builder, E. Earnshaw.

F. White, three-st'y store and dwell., 817 Milwaukee Ave.; cost, $6,000.

G. Fiedler, three-st'y store and dwell., 3644 State St.; cost, $9,000; architects, Furst & Rudolph; builders, McMillan Bros.

J. M. Pearson, two-st'y dwell., 3319 Forest Ave.; cost, $3,000; builder, B. F. Branch.

Detroit.

BUILDING PERMITS.—*Gratiot Ave., No.* 246, three-st'y brick stores; cost, $8,000; A. J. Moran, owner.

Brush St., Nos. 470-474, double brick house; cost, $12,000; Wm. Scott & Co., architects.

Cass St., double brick house; cost, $7,000; P. McDonald, builder.

Woodward Ave., 2 stores; cost, $3,500; Mrs. Bradshaw.

Woodbridge St., 2 stores; cost, $20,000; Mr. Weeson; W. Scott & Co., architects.

Cass Ave., Nos. 507-511, 2 dwells.; cost, $13,500; John Waterfall, builder.

Joy St., Nos. 28 *and* 30, 2 brick dwells.; cost, $9,000; Mrs. Green, owner.

McDougall Ave., brick dwell.; cost, $7,000; T. A. Wadsworth, builder.

Hendrie Ave., No. 24, frame dwell.; cost, $3,000; T. A. Wadsworth, builder.

Third St., Nos. 350-354, 3 brick dwells.; cost, $5,000; T. A. Wadsworth, builder.

Woodward Ave., Nos. 1416, 2 brick stores; cost, $4,000; J. R. McBrearty, builder.

West Columbia St., No. 54, double brick house; cost, $5,000; W. C. Shaw, builder.

Cass Ave., No. 730, brick building; cost, $5,000; W. C. Hayes, builder.

Jefferson Ave., No. 670, brick dwell.; cost, $10,000; Jas. W. McGregor, builder.

Fremont St., brick church; cost, $6,000; Albert Albrecht, builder.

Peterboro St., No. 38, brick dwell.; cost, $11,000; Joseph Taylor, owner; G. W. Lloyd, architect.

Woodward Ave., double brick house; cost, $15,000; Gen. W. T. Baynal, builder.

Woodward Ave., church; cost, $83,000; Baptists, owner; M. S. Smith, architect; Topping & Fisher, builders.

Cass Ave., brick dwell.; cost, $8,000; S. W. Itsell, builder.

Cass Ave., No. 507, brick dwell.; cost, $7,500; John Waterfall, builder.

Woodbridge St., five-st'y brick store; cost, $20,000; N. Mitchell, builder.

Congress St., three-st'y building; cost, $25,000; American News Company, owner; Donaldson & Meier, architects.

Joy St., 2 residences; cost, $9,000; Mrs. Green, owner; Donaldson & Meier, architects.

McDougall Ave., brick dwell.; cost, $7,00; architects, same as last.

Charlotte Ave., 3 houses; cost, $20,000; John Waterfall, owner; architects, same as last.

Gratiot Ave., brick store; cost, $500; Jacober, owner; architects, same as last.

Minneapolis, Minn.

BUILDING PERMITS. — P. G. Lamoreaux, two-st'y frame saw mill, s w cor. Water St. and Tenth Ave., n e; cost, $20,000.

P. G. Lamoreaux, 3 two-and-one-half-st'y frame dwells., w s First Ave., south, bet. Thirty-second and Thirty-third Sts.; cost, $19,500.

E. B. Cooper, double two-st'y dwells., w s Portland Pl., bet. Twenty-second and Twenty-third Sts., south; cost, $4,000.

A. J. Finnegan, three-st'y brick store and office-building, 312 Hennepin Ave.; cost, $13,000.

Campbell Bros., two-st'y frame on First Ave., s.; cost, $3,000.

New York.

APARTMENT-HOUSES. — On the e s of Second Ave., from Seventy-sixth to Seventy-seventh St., 8 flats to cost $128,000, are to be built by Messrs. Higgins & Keating.

On the n s of Sixty-second St., 225′ e of Tenth Ave., a five-st'y brown-stone flat, 25′ x 84′, is to be built for Mrs. Kelly, at a cost of about $20,000; from plans of Mr. Montrose W. Morris.

On the e s of Fifty-fifth St., 225′ e of Eleventh Ave., 5 five-st'y brick, stone, and terra-cotta double tenements, 25′ x 84′ each, are to be built by Mr. C. H. Bliss, at a cost of about $100,000; from plans of Messrs. Thom & Wilson.

On the s s of One Hundred and Eighteenth St., 90′ e of Fourth Ave., 2 five-st'y brick and brown-stone tenements, 25′ x 84′ each, are to be built for Mr. H. Chenoweth; from plans of Mr. J. C. Burne.

RESIDENCES. — On the s w cor. of Fifth Ave. and One Hundred and Twenty-eighth St., 5 or 6 four-st'y brown-stone residences are to be built by Mr. Robt. Elliot.

BUILDING PERMITS. — *Forty-seventh St.*, s s, 260′ e Tenth Ave., 3 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner and builder, Joseph Johnston, 475 Second Ave.; architect, Julius Boekell.

Railroad Ave., e s, 190′ 4″ n One Hundred and Sixty-ninth St., one and part two-st'y brick factory, tin roof; cost, $9,000; owner, George Hey, 331 Broome St.; architect, Julius Boekel.

East Forty-fifth St., Nos. 331, 333, *and* 335, two-st'y brick stable, tin roof; cost, $8,000; owners, Oppermann & Muller, 346 East Forty-sixth St.; architect, Chas. Stoll.

Eighth Ave., w s, from One Hundred and Fifth to One Hundred and Sixth St., four-st'y brick and stone hospital building, slate and tin roof; cost, $190,000; owner, New York Cancer Hospital, Jno. E. Parsons, President, 208 Madison Ave.; architect, Chas. E. Haight.

First Ave., w s, Forty-first to Forty-second St., four-st'y brick factory, tin roof; cost, $35,000; owner, W. L. Cutting, 24 West Twenty-second St.; builders, Dawson & Archer.

One Hundred and Sixth St., n s, 150′ w Ninth Ave., five-st'y brown-stone front tenement, tin roof; cost, $24,000; owner, Wm. B. Pettit, 444 West Thirty-fourth St.; architects, A. B. Ogden & Son; built by day's work.

ALTERATIONS. — *East One Hundred and Nineteenth St., Nos.* 317 *and* 319, one-st'y brick extension, tin roof; cost, $3,500; owner, St. John's German Evangelic Lutheran Church, on premises; architect, Bart. Walther.

Ninety-second St., s s, 200′ e Third Ave., raise two st'y and internal alterations; cost, $35,000; owner, Geo. Ringler & Co., on premises; architect, Charles Kinkel.

South Washington Sq., No. 52, raise one and a half st'y, and a four-st'y brick extension, tin roof, arrange for flats; cost, $25,000; owner, Wm. S. Maddock, 313 East One Hundred and Twenty-Third St.; architects, Maclay & Davies; builders; Wm. Haigh and James H. Banta.

Bond St., No. 32, raise attic to full st'y, remove interior partitions, etc.; cost, $6,000; owner, Chas. E. Butler, trustee, by Aug. White, 409 Broadway, builders, F. & W. E. Bloodgood, and P. Roberts.

Broadway, Nos. 503 *and* 505, put in a passenger elevator; cost, $5,000; owner, Joseph F. Loubat, 155 Fifth Ave.; architect, Jno. B. Snook; builder, not selected.

One Hundred and Thirteenth St., s s, 50′ w First Ave., two-st'y brick extension, tin roof; also raise present extension one st'y; cost, $7,000; owner, John Dwight, 33 Mt. Morris Ave., and John R. Maurice, Maspeth, L. I.; architect, J. W. Davison; builders, J. & W. C. Spears, and R. Thompson.

St. Louis.

BUILDING PERMITS. — Forty-three permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

M. M. Manney, two-st'y brick dwell.; cost, $5,000; I. Taylor, architect.

Mrs. Troxler, two-st'y brick dwell.; cost, $3,000; Biermann & Ahring, contractors.

F. Tacke, two-st'y brick dwell.; cost, $3,600; G. S. Gerber, contractor.

T. Collins, two-st'y brick dwell.; cost, $3,400; C. L. Aufderheide, contractor.

Fred. Gottschalk, 2 adjacent two-st'y brick dwells.; cost, $4,000; G. Meumeister, contractor.

S. M. Hellmann, 3 adjacent two-st'y brick dwells.; cost, $6,000; A. Beinke & Co., architects; T. G. Gorman, contractor.

J. Morrison, two-st'y brick dwell.; cost, $6,500; sublet.

J. Dwyer, two-st'y brick dwell.; cost, $4,100; Gaines, architect; John Dwyer, contractor.

Washington.

BUILDING PERMITS. — The following permits have been issued since last report, for new buildings worth $3,000 or over: —

H St., bet. Four-and-a-half and Sixth Sts., s w, brick dwell., for Patrick Cullimane; Holtzlaw & Hepburne, builders; cost, $2,500.

Seventeenth St., bet. O and P Sts., n w, 3 dwells., for C. V. Trott; cost, $11,000.

I St., bet. Thirteenth and Fourteenth Sts., n w, 2 dwells., for W. C. Morrison; cost, $9,400.

Alley, bet. M and N Sts., Nineteenth and Twentieth Sts., n w, private stable, for C. Heinrich; C. A. Didden, architect; cost, $6,000.

Green St., bet. West and Stoddart Sts., n w, 2 dwells., for Jos. F. Birch; J. J. Fry Sons, architects and builders; cost, $8,000.

Fenton Pl., 13 two-st'y dwells., for C. W. King; cost, $5,200.

Eleventh St. cor. K St., n w, three-st'y brick dwell., for Weston Flint; T. F. Schneider, architect; cost, $17,000.

Twenty-first St., cor. Mass. Ave., s w, three-st'y brick dwell., for B. H. Warner; Wm. M. Poindexter, architect; cost, $15,000.

Seventh St., s e, 2 dwells., for Jos. Boudren; cost, $4,000.

Mass. Ave., bet. Thirteenth and Fourteenth Sts., n w, three-st'y dwell., for Chas. A. James; Gray & Page, architects; M. M. Magruder, builder; cost, $15,000.

Eighth St., bet. E and D Sts., n w, private stable, for E. Burgdorf; cost, $3,000.

K St., bet. North Capitol and First Sts., n w, two-st'y brick dwell., for P. Ginney; cost, $2,000.

Alley, rear of Mass. Ave., bet. Thirteenth and Fourteenth Sts., n w, studio, for R. Hinckley; R. I. Heming, architect and builder; cost, $3,000.

Sixteenth St., cor. K St., s w, three-st'y brick dwell., for Mrs. Lucy J. Wheeler; Arthur Hooper Dodd, architect; Dearing & Johnson, builders; cost, $14,500.

C St., bet. First and Second Sts., n e, two-st'y dwell., for Mrs. F. Lenfert; cost, $2,300.

Twenty-eighth St., n w, two-st'y brick dwell., for I. N. Rollins; cost, $5,000.

Four-and-a-half St., cor. M St., two-st'y building, for Jas. Archer; cost, $3,500.

South Capitol St., bet. K and L Sts., s w, 7 dwells., J. H. Grant; cost, $5,000.

Four-and-a-half St., cor. H Sts., s w, 5 dwells., for Wm. Buckley; cost, $4,000.

L St., bet. North Capitol and First Sts., n w, two-st'y dwell., for W. F. Nash; cost, $2,000.

Alley, bet. Thirteenth and Fourteenth Sts., and M and N Sts., n w, private stable, for J. V. Huck; S. T. G. Morsell, architect; cost, $2,500.

Tokoma Park, county, two-st'y dwell.; cost, $2,500.

New York Ave., between Ninth and Tenth Sts., n w, three-st'y dwell., for Wm. Hahn; C. A. Didin, architect; cost, $8,000.

N St., bet. Fourth and Fifth Sts., n w, 3 two-st'y dwells., for N. T. Haller; cost, $7,000.

General Notes.

CHARLOTTESVILLE, VA. — Stone church for University of Virginia, style, early poluted, cruciform; seating capacity, 300; cost, $15,000; Chas. E. Cassell, architect, Baltimore.

KANSAS CITY, MO. — Permit to Josiah Kellogg, to build a brick business-house, 27′ x 47′ and five stories high, at Ninth and Main Sts., adjoining the *Times* building on the north; cost, $12,000.

RHODES, IO. — Two-st'y brick building; Foster & Liebbe, architects; cost, $7,000.

ST. PAUL, MINN. — E. S. Esty, two-st'y brick block, stores and dwells., 50′ x 120′, s e cor. of Exchange and Seventh Sts.; cost, $7,500.

WONSECA, MINN.—Dwell., for Mr. Miller; cost, $7,000; C. A. Dunham, architect, Burlington, Iowa.

Double house for Dr. J. B. Weller and Mrs. Stone; cost, $8,500; architect, Edward L. Woodruff.

House for A. MacCafferty, Esq.; cost, $3,500; architect, Edward L. Woodruff.

WASHINGTON, CONN. — For Mr. E. S. Barnes, a two-st'y and attic dwell., 30′ x 40′, is to be built at a cost of $10,000, from designs of Messrs. Rossiter & Wright, of New York.

Parker, Cook & Gowen, one-st'y frame roller skating-rink, 65′ x 180′, Summit Ave.; cost, $6,000.

COMPETITION.

AMERICAN ARCHITECT COMPETITIONS.—NEW SERIES.

As the busy season for this year has nearly passed, the younger men who have in past years evinced an active interest in the little competitions we have held from time to time, may be ready to test once more their skill in design in competition with their fellows. Therefore we take pleasure in inviting their attention to the following

PROGRAMME.

Most people who live in the country, or in the suburbs of a large town, and have sufficient means, usually feel obliged to "set up their carriage," and of course a carriage implies horses, and a building in which the entire establishment can be housed. Therefore we propose as the subject of the present competition a barn such as the dweller in a house that has cost $5,000 would consider an appropriate adjunct of his establishment; but as this may be somewhat ambiguous, seeing that some men think more of their horses than they do of their families, we will say that the proprieties would be best observed if the cost of the barn should range between $1,000 and $1,500.

The barn must furnish accommodation for two horses and a cow; the carriage-room must be large enough for two wheeled vehicles and a sleigh; and proper provision must be made for harness, feed and hay, and the stableman must not be overlooked. Water and ventilation must also be kept in mind.

Required:—A perspective drawing of the barn, elevations of the sides not shown in the perspective, a plan or plans, and a reasonable amount of detail; all to be included on a single sheet, 21″ x 33″ within the framing lines. A short description and the result of a *bona fide* estimate must also be furnished. For the best three designs we will pay equal prizes of thirty dollars each.

Conditions: — Drawings must be received at the office of the *American Architect*, on or before Saturday, December 20, 1884.

The three prize drawings are to remain the property of the publishers.

All designs submitted are subject to publication in the *American Architect* at the pleasure of the editors.

All designs must be sent in signed only by a motto —*not a graphic symbol*—the name and address of the author being sent enclosed in a sealed envelope, endorsed with a duplicate motto.

The jury of award will be composed of three architects.

PROPOSALS.

IRONWORK.

[Near Charleston, W. Va.]

U. S. ENGINEER OFFICE, 378 ST. PAUL ST.,
BALTIMORE, MD., October 30, 1884.

Proposals for ironwork in the foundations of a movable dam, at Lock No. 6, on the Great Kanawha River, W. Va., about four miles below Charleston, will be received at the U. S. Engineer Office, Charleston, Kanawha County, W. Va., **until noon of December 2, 1884,** and opened immediately thereafter.

Blank forms, specifications, and any desired information can be had upon application to Mr. A. M. Scott, Assistant Engineer at that office.

WM. P. CRAIGHILL,
465 Lt.-Col. of Eng'rs, U.S. Army.

POROUS TERRA-COTTA TILE FOR ROOFS.

[At Buffalo, N. Y., and Toledo, O.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., November 7, 1884.

Sealed proposals will be received at this office, **until 2 P. M. on the 22d day of November, 1884,** for furnishing the porous terra-cotta tiles for the roof of the custom-house, etc., buildings at Buffalo, N. Y., and Toledo, O., estimated as follows: —

4,500 superficial feet at Buffalo, N. Y. 13,000 superficial feet at Toledo, O., in accordance with drawing and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent at each building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. H. G. JACOBS,
465 Acting Supervising Architect.

TIMBER, BOLTS AND STONE.

[Near Pt. Pleasant, W. Va.]

UNITED STATES ENGINEER OFFICE,
CINCINNATI, O., October 23, 1884.

Setled proposals in duplicate, will be received at this office **until noon** (local time) **on Monday, the 8th day of December, 1884,** for furnishing material and building two ice piers in the Great Kanawha River near Point Pleasant, West Va.

Approximate quantities of material required: —

204,472 feet B. M., oak timber.
9,536 lbs. iron dirft bolts.
2,486 cubic yards riprap stone.

Specifications and blank forms for proposals will be furnished on application to this office. Letters asking specifications should be marked "Official Business" on the envelope. WM. E. MERRILL,
466 Lt.-Col. of Engineers.

TIMBER.

[At Chicago, Ill.]

UNITED STATES ENGINEER OFFICE,
25 HONORE BUILDING,
CHICAGO, ILL., November 8, 1884.

Sealed proposals in triplicate, will be received at this office, **until 12 o'clock, noon, Tuesday, December 9, 1884,** for furnishing pine and hemlock timber for breakwater construction at Chicago, Ill. The total amount required will be about two millions one hundred and sixty-seven thousand (2,167,000) feet B. M., to be delivered between the opening of spring navigation and September 1, 1885.

Parties who are not prepared to furnish the entire lot may submit propositions for a portion only, but not for less than two cribs.

For specifications, blanks for proposals, and all information, apply at this office.

WM. H. H. BENYAURD,
466 Major of Engineers, U. S. A.

SAFES AND VAULTS.

[At Washington, D. C.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., October 23, 1884.

Sealed proposals will be received at this office until **2 P. M., on the 25th day of November, 1884,** for supplying the burglar-proof safes and chests, fire and burglar safes combined, fire-proof safes, fire-proof doors, shell safes, and single and double steel-lined vault-work required by the Treasury Department, and as may be ordered during the fiscal year ending June 30, 1885, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, on and after November 5, 1884.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
464 Supervising Architect.

IRON WORKS.

[At St. Louis, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., October 24, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 8th day of November, 1884,** for furnishing and fixing in place complete the cast-iron ornamental panels for area railing around the custom-house and post-office building at St. Louis, Mo., in accordance with drawing and specification, copies of which may be seen and any additional information obtained on application at this office, or the office of the custodian at the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
464 Supervising Architect.

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FOR SALE.

STEAM DERRICKS. — For sale, at the works of Wm. Struthers & Sons, n w cor. Twenty-fourth and Walnut Sts., Philadelphia, two overhead steam derricks, with false works and rail. Frames and rippers of Merriman's patent, including steam engine and boiler, with pump; also pulleys and shafting connected with saws. Steam crane on end of wharf. All the above machinery in very good order. Can be removed from the premises on or about the middle of January, 1885. Tools and other utensils connected with the marble work sincluded. Apply at the office of the firm, n w cor. Twenty-fourth and Walnut Sts., Philadelphia, Pa.

POPOSALS.

STONE AND BRICK WORK.
[At Dallas, Tex.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 18th day of November, 1884,** for all the labor and materials, stone, brick, mortar, etc., and building complete the basement and area walls of the court-house, post-office, etc., building at Dallas, Texas, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after time of opening, will not be considered.

M. E. BELL,
464 Supervising Architect.

MARBLE TILING.
[At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 o'clock, P. M., on the 22d of November, 1884,** for furnishing and laying all the marble tiling required in the custom-house and post-office building at Kansas City, Mo., in accordance with the drawings and specification, copies of which and any additional information may be obtained on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
464 Supervising Architect.

PROPOSALS.

CITY-HALL.
[At Richmond, Va.]

CITY ENGINEER'S OFFICE,
RICHMOND, VA., October 15, 1884.

Sealed proposals are invited **until December 1st, at 12 o'clock, M.,** for building a new city-hall at Richmond, Va.

Drawings, specifications, and printed forms can be seen at this office.

The Committee on Grounds and Buildings reserves the right to reject any and all bids.

For further information apply to the undersigned.

466 W. E. CUTSHAW, City Engineer.

STONE AND BRICK WORK.
[At Jefferson City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 18th day of November, 1884,** for all the labor and material, stone, brick, mortar, etc., and building complete the basement walls of the court-house, post-office, etc., building at Jefferson City, Mo., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening, will not be considered.

M. E. BELL,
464 Supervising Architect.

COURT-HOUSE FRONT.
[At Woodstock, Va.]

Sealed proposals will be received at the office of the Clerk of the County Court of Shenandoah County, **until Monday, November 24, 1884. 10 o'clock, A.M.,** for furnishing the materials and performing the necessary labor for the erection of a court-house front at Woodstock, Va.

The building to be of brick, with stone facing, 46′ x 75′, two-st'y, with mansard roof and tower, with the clerk's offices (Circuit and County) on the lower floor fire-proof.

Plans and specifications may be seen at the County Clerk's Office, or at the office of T. F. Schneider, Architect, 933 F St., n w Washington, D. C.

Each bid must state the time required for the completion of the building, and a proper bond will also be required of the person who is awarded the contract.

The Board of Supervisors reserve the right to reject any and all bids.

By order of the Board. L. S. WALKER,
464 Clerk Board Supervisors Shen. Co. Va.

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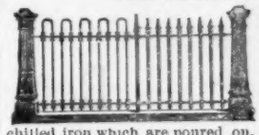

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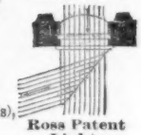

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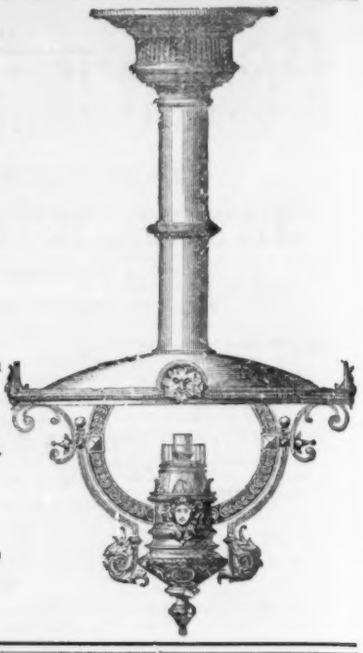

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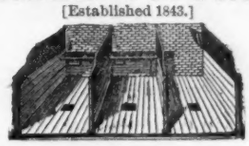

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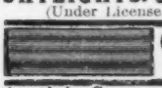

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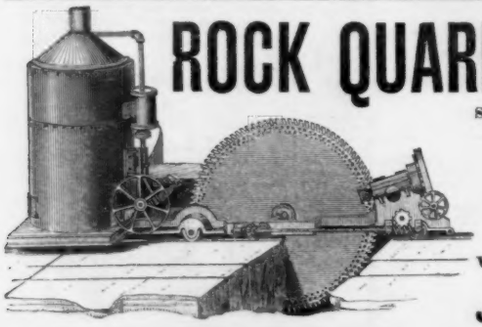

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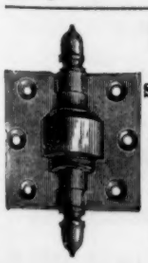

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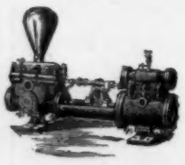
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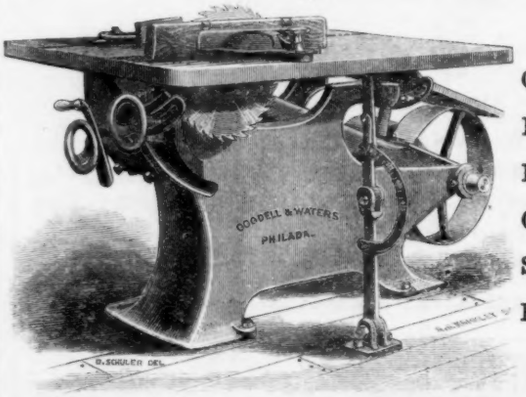

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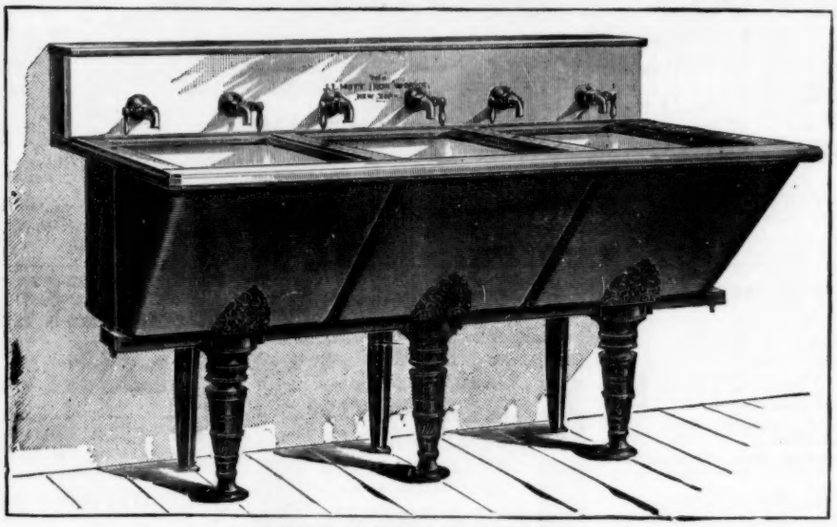

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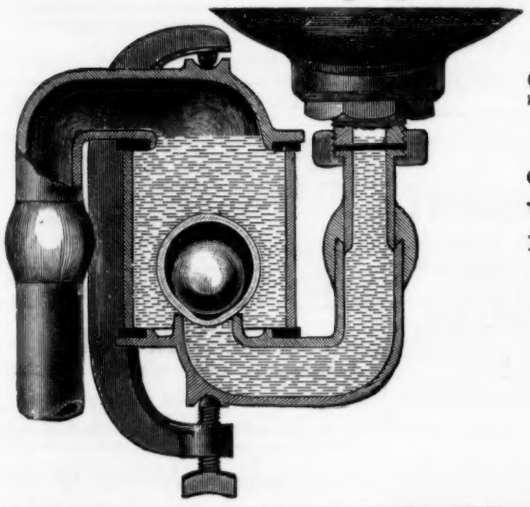

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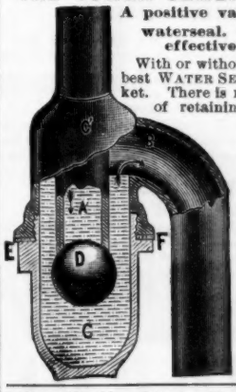

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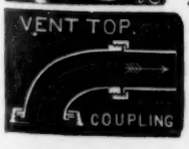

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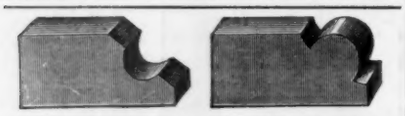

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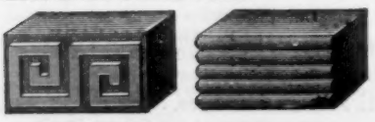

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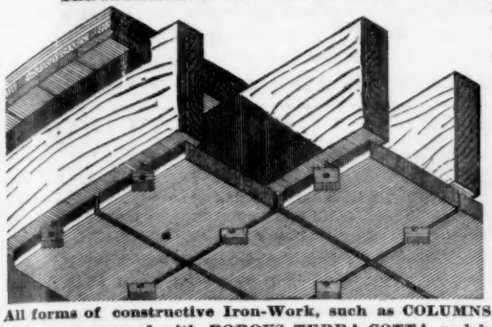

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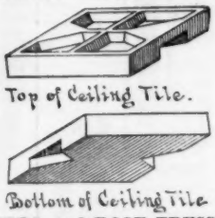

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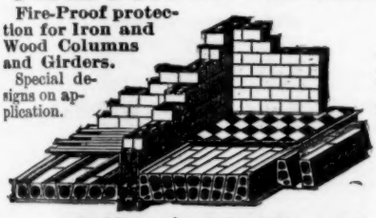

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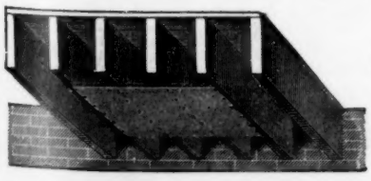

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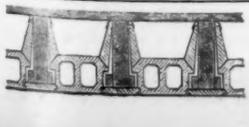

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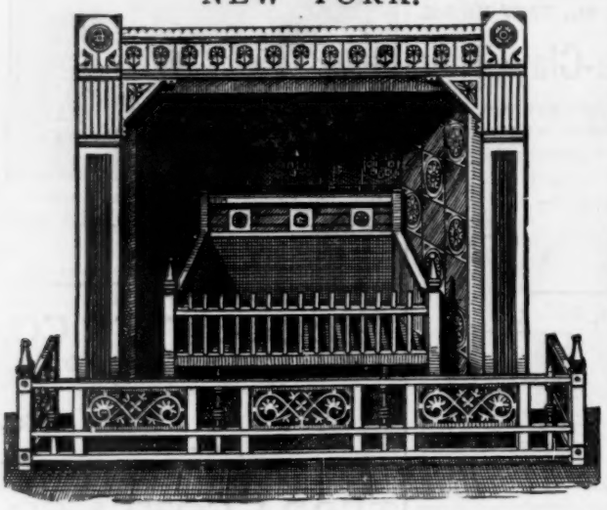

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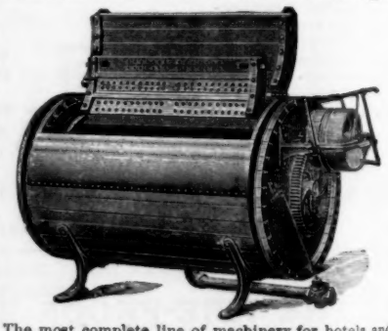

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